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EUROPEAN GLASS

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A brief outline of the History of Glass Making, with Notes
on Various Methods of Glass Decoration, illustrated by
examples in the collection of the Author

BY

WILFRED BUCKLEY, C.B.E.

with a Foreword by

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and with

an Essay on Dutch Glass Engravers by
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FOREWORD

By BERNARD RACKHAM

Glass is often associated with pottery as one of those arts which are called by the French " les arts du feu," and has much in common with it. The forms in which it is embodied have often, indeed, a general resemblance superficially to those of the ceramic art, but underlying these apparent correspondences are essential differences which are of vital significance. For glass and pottery alike heat is an essential in the process of manufacture ; but the heat is needed for the one substance to fuse its constituent materials into a soft consistency before it can be given the shape desired, for the other the function of heat is to harden and make firm the shape it has already received at the hands of the potter. In both cases control is applied from without, in resistance to an expansive force—the breath of the glass blower, the centrifugal urge given to the clay by the turning wheel—in order to guide the material into the shape required. There are, moreover, two great physical differences between potter's clay and glass. The first consists in the greater cohesive quality of glass under expansion. This quality makes possible in the walls of a glass vessel a degree of thinness which is quite unattainable with potter's clay unless, as in the various types of porcelain, it is blended with fusible ingredients to form a hybrid substance having something of the nature of pottery and glass as well. The other obvious difference between the two belongs to their nature in relation to light. Glass is normally translucent and in most of its types transparent ; pottery is never transparent, and is translucent only in that form of porcelain which we have described as a hybrid between pottery and glass. In these two qualities, of cohesiveness under expansion and of translucency, by which chiefly glass is distinguished from pottery, we have also the qualities to which the former owes its peculiar æsthetic virtues.

Pottery, in its more primitive forms at all events, makes its appeal to the senses chiefly by its mass, by the sense it gives of something in the perception of which the eye is helped, at least potentially if not actually, by the hand—a thing to be grasped and felt if its virtues of contour and substance are to be appreciated to the full. Mere outline and even colour are qualities of secondary importance, and this is incidentally the reason why illustrations of pottery so often fall short of adequacy. They fail to convince, even where colour has been faithfully reproduced, for the very reason that projection has been missed ; suggestion hardly goes beyond a plane bounded by curved outlines. With glass it is far otherwise. The touch is hardly needed as an aid to sight; indeed, a touch of the hand may even interfere with an untroubled appreciation. The light weight and the feeling of fragility communicated by handling present to the mind the idea of something too delicate for exposure to the hazards of touch, just as we feel that nothing is to be gained in appreciation of their æsthetic values by fingering a flower or a butterfly.

The ductility of the material in its molten state suggests to the glass-blower the forms which his vessel may receive, and they may be of almost infinite diversity and intricacy, although in prudence some limits must be set to what is permissible. To create forms so frail that they can have no chance of survival is merely to defeat one's own ends. When once the vessel has received by cooling its fixed shape, light begins to play its part in the disclosure of its values. Glass in its purest and most perfect form is as colourless as water, and like water depends upon light to proclaim its presence; its lines and curves, its dappled or embossed surface, are disclosed to the eye by the gleams and flashes of reflected light. Many will be ready to place in the foremost rank of nobility those types of glass which depend for their appeal solely upon qualities innate in them from the first moment of their shaping under the tools of the blower. Good forms, plain and unadorned, devised with an eye fixed all the time on the purpose for which the vessel is intended—by their sheer simplicity and reticence they win the day against many a work on which hours of labour have been spent in technical processes aimed at enhanced embellishment. In any collection of Venice glass of the early Renaissance period such pieces may be seen, and on quiet reflexion they will be found more lastingly agreeable than many of their more pretentious or more elaborate companions; ancient Roman glass, too, provides many examples to prove the soundness of this contention, and when we look at glass of that early period we have always to remember that, in estimating its original aspect, discount must be allowed for the disturbing effects of age and decay. The same virtue may be discovered, though in a blunter, less subtly compounded manner, amongst 18th-century glass, especially English. It is to this fact, doubtless, that we may attribute the fascination which the collecting of wine-glasses has, and not for those collectors only whose chief concern is rather with what is rare and exceptional or romantically curious than with what is æsthetically good.

The staining of glass with a colouring oxide was known long before the discovery was made of the use of the blow-pipe for fashioning glass vessels, and one of the chief glories of the material consists in the readiness with which it will take on hues of a beauty surpassed in no other artificial substance. Glass stained with the commonest of these colours—the blue, green and purple yielded by cobalt, copper and manganese—may aptly be compared with sapphire, emerald and amethyst, and it is the translucency which it shares with these natural stones that gives it such radiance of hue as no opaque substance can show. It is to these two properties of glass—its translucency and its susceptibility to tincture—that stained-glass painting, a late-comer among the arts, but one of the noblest and surely the most beautiful, owes its peculiar glories. Already in Roman times the chromatic beauty and power of coloured glass was fully appreciated; in this respect the Roman glass-blowers were equalled, it may be, but not surpassed by the Venetians of later times. Colour is perhaps the chief virtue of modern Chinese glass, and at the same time too often, owing to brutal discords in which incompatible tones are combined, one of its chief vices. Our pleasure in vessels of coloured glass is due perhaps not entirely to the effect upon vision of pure colour, intense as that of the brightest flowers or delicate as the hues of dawn; in part we owe it to the illusion of something immaterial, æthereal almost, of a substance yielding and penetrable, too delicate for heedless handling. In spite of the odious misuses to which it can be put, coloured glass remains one of the loveliest creations of human inventiveness.

Embossment of surface is one of the readiest methods of glass decoration, arising in the actual process of manufacture either by pinching and shaping with tongs, by blowing into a mould, or by the application of drawn-out threads. All these methods may be used with good effect, as Roman glass-blowers pre-eminently have shown us, but in all there lies a dual possibility. The form of a vessel may be emphasized, its grace or power enhanced and accentuated by the patterns or figures that break from the planes of the surface; or it may be obscured or even destroyed by the lack of restraint which so easily besets the craftsman who takes the path of ornament for the sake of ornament.

A less direct method of breaking the surface is brought into play by the use of the cutter's wheel. In the days of the Roman Empire this type of glass decoration, familiar in modern times to the degree of overshadowing all others, was already practised, and with a moderation and good judgment which are a reproach to many later craftsmen; shallow cutting in angular facets or in concentric circular planes was used by the ancients in studied relation to the shape of the vessel, often with that effect of reiteration by which ornament can be made a powerful aid to the impression produced by the shape itself. Again, in the 18th century, especially in English glass of lead, cutting came into favour as a mode of decoration; in the earlier stages of the revival it was limited to broad, shallow faceting designed in close relation to the shape of the vessel and is a distinct enhancement to the effect of the whole. A certain practical purpose is also served by it in giving a better hold to the grip on the body of a decanter or the stem of a wine-glass. But, as often happens, what began as an embellishment, helpful to visual effect and practical use alike, came to be used without restraint till it reached the pitch of flaunting and ungainly extravagance so highly extolled by the critics of the day at the Great Exhibition of 1851. The almost incredible bizarrerie of the prickly monstrosities created in early Victorian times is apt by its very eccentricities to break through the defences of æsthetic approbation and to force its way into the attention of the collector; but the results of all this misused ingenuity will hardly win the approval of a considered and sober judgment.

Akin to cutting are the various methods of engraving on the wheel which were carried to such a pitch of technical accomplishment in Germany and Bohemia. In this case there is less interference with the general form as received from the pipe and tools of the blower. Where patterns have been applied with moderation and in limited extent, they will serve as a help to apprehension of the general form of the vessel; but the tendency is to cover with a lacework of intricate ornament the whole surface. Here, as in every form of craftsmanship, the danger of accessory ornamentation arises from a lack in the artist of the sensitive feeling which should make clear to him the limits beyond which he may not go. The danger is specially acute where decoration takes the form of pictorial representation, in which the temptation is always to aim at the nearest likeness to nature attainable in the medium, without heed for the consequence on the general æsthetic effect. The result of all such lack of moderation, in glass engraving no less than in other decorative arts, is the destruction of the main lines of form under a mass of detail. The wonderful skill of technique shown in the finest German wheel-engraved glasses may make up only in part for the loss of nobility involved. But here a word of reservation may be uttered; there are many glasses in which from the first engraved decoration has been the main object and the shapes make no pretentions to serious estimation on their own account, particularly the cylindrical tankards and conical beakers or tumblers which became common in the course of the 17th century. To judge these by too austere a standard would be a mistake; we may well give ourselves up whole-heartedly to the enjoyment of the skill and intricate delicacy of the engraver's workmanship, beautiful indeed in itself as an artistic achievement. Engraving with a diamond, spreading as it were a web of gossamer threads over the gleaming surface, involves less risk to the effectiveness of the shapes, as it does not set up the system of cross lights and reflections created by the deeper incisions of engraving and polishing on the wheel.

Both methods of glass engraving, on the wheel or with the diamond point, are obviously risky and call for a sure eye and a steady hand controlled by a mind always on the alert. When successful, they win the enhanced commendation always owing where a risky venture has been carried through. Poor workmanship, on the other hand, is readily detected; ragged or weak execution betrays itself with disturbing effect. Every stroke produced is done beyond recall; a mistake can never be retrieved. The collection described in this volume provides an interesting commentary on this point. The rare German tankard with figures of the Emperor and the seven Electors (Plate 29) is inscribed with verses glorifying the sovereign and explaining the functions of his companions. By mistake the engraver has written the verses relating to the spiritual electors below the figures of the laymen and *vice versa ;* an explanation of his oversight is written in a narrow panel which would otherwise probably have been filled with an ornamental motive. In this case the error was of no consequence from an artistic point of view, and was, in fact, due rather to a slip of the memory than to a failure of the hand. A faltering hand might easily spoil an otherwise apt design.

The process of stipple engraving, much affected by the Dutch, produced much that arouses our wonder at its dexterity; it is in the nature of a toy, a *tour de force,* and must not be criticized too seriously as a means of decoration. The cloudy film with which it overlays the surface begins to have a meaning only when on close inspection it is found to be a picture. It is yet another illustration of that trend towards pictorialism in design which is common in all branches of modern applied art. But here again we must beware of too austere and exacting an attitude. These stippled glasses are a very charming and delicate sport of fancy, never meant to be pondered over in a mood of earnest contemplation. We only need to examine the fine specimens of this class in this collection to realize how delightful they can be.

The last important mode of ornamenting glass which we have to consider provides another illustration of the growth of the pictorial tendency. Enamel painting on glass is in a different category from the methods we have hitherto been discussing. The various processes of engraving and cutting, by which something is taken from the surface of the vessel after it has been crystallized by cooling into its stable shape, allow of no alteration or correction of a stroke or cut once made. Painting, on the other hand, is an addition to the surface, and as a rule involves virtually no alteration in its contours. It may be amended or expunged at will during the process of execution ; it is therefore much less exacting in its demand on the steadiness of the artist's hand and the decisiveness of his intention than the manipulation of cutting or engraving tools. It contributes to glass production the important element of varied colouring (otherwise attainable only by much more laborious means), and is capable of entirely satisfying results. As, however, each spot or stroke of enamel pigment takes something from the translucency of the metal, any excess of painting destroys the very qualities which are the peculiar beauty of glass. Enamel decoration was practised with surpassing skill by the Syrian glass-makers of the Middle Ages ; it is seen at its best perhaps in Venetian glass of the early Renaissance period, on which it is generally restricted to a few lines and jewel-like spots, with perhaps also a shield or a small floral or figure motive ; these painted ornaments are applied with careful regard for the shape of the vessel to the beauty of which they are a distinct enhancement. In German enamelled glass the tendency to pictorial representation, which painting brought within the bounds of attainment much more readily than any other mode of glass decoration, was often too strong for the artist ; it resulted sometimes in the smothering of the surface with designs interesting and even pleasing in themselves, but suited to almost any material better than to glass.

When once pictorialism has been admitted in design it is in danger of becoming an end in itself, its decorative intention being lost from view. The decoration of glass is not always free from this defect, any more than other branches of applied art. Where it has not been avoided, attention is drawn away to the meaning of the design, which interests us for reasons irrelevant to its æsthetic appeal. Glasses engraved with emblems, allusive devices or mottoes are often attractive primarily on account of the train of thought which they suggest, and would perhaps find more unqualified commendation on purely æsthetic grounds had they been left unadorned with these appeals to the intellect.

Various guiding principles may be followed in the gathering of a collection of old glass. Some collectors will be impelled chiefly by the considerations at which we have just hinted. They will select their specimens for the allusive curiosities of their decoration, and this has been the practice of those collectors of English glass whose chief ambition is to secure rare glasses made for the devotees of the Jacobite cause and their political opponents ; Dutch and German glasses also offer exceptional inducements to the formation of a collection on these lines. Others will fix their attention chiefly on rare features of shape or decoration—a stem of unusual form, the presence or number of knops upon it, some abnormality in the proportion of one member to another ; such considerations are closely analogous to the attention of the stamp collector to niceties of perforation and watermark or aberrations of the engraver. With some, cultural or ethnographical interest will be paramount—the use of the various vessels, their function in the social life of a people. All these are human considerations, and as such are worthy to be taken into account by beings lower, though but a little, than the angels.

The most lasting satisfaction, however, is likely to be found where the merits of a piece in its appeal to the eye are the final and undisputed criterion by which it must be allowed or refused inclusion. Other considerations may be admitted in reinforcement of a claim already made good on æsthetic grounds, but to such a collection only an exceptional piece here and there of great historic or technical importance will be admitted that does not find acceptance because it pleases the eye and for no other reason. The collection described in this volume, comprising glasses of many different lands and made over a wide range of date, exhibiting most of the technical resources which the glass-maker has from time to time enlisted, is one which may fairly claim to have been formed primarily on these last, most satisfactory lines.

Glass-blowing is a late-comer among the crafts of mankind. Compared with pottery, weaving and metal-casting it has small claims to the respect allowed to mere antiquity. For beauty of achievement, however, its title to esteem is of the best. Few arts command a material more apt for originality and individualism of expression ; none perhaps has been more independent of the stereotyped artistic formulas of the ages. None other of the plastic arts may so justly boast of harnessing to its service the very light to which we owe the gift of vision itself.

DIAMOND ENGRAVING

By DR. FERRAND HUDIG

Engraving is certainly the simplest way of giving a durable decoration to a glass; still, it is the exception to find one decorated in this way. The reason may be that it takes up much time, and patience is not a flower that grows in everyone's garden. The Dutch seem to excel in this virtue; in any case, by far the majority of engraved glasses originate in the Low Countries.

The technique of engraving glass by scratching is old. In Roman times we already find a good many examples of engraved glasses. They show flowers and fruit festoons and amorettos; inside the outlines of the figures the glass is made somewhat dead, or shadows are indicated by cross strokes. Often the outlines are also reinforced by short cross strokes. Most of these glasses bear inscriptions, and not uncommonly freehand and wheel-engraving are combined.

There are plenty of engraved glasses dating from early Christian times to be found decorated with religious subjects, such as the Baptism of Christ, the Good Shepherd, Christ between St. Peter and St. Paul, the Twelve Apostles, Daniel and the Lions, Abraham sacrificing Isaac, Susannah, etc. The engraving is applied on the outside of the glass, but is meant to be seen from the inside.

In the 4th and 5th centuries engraving is found on green glass as well as on colourless. The engraving on the colourless glasses is sometimes reinforced by gilding (not to be confounded with the fondi d'oro, where the engraving is worked in the gold and not on the glass). The rougher green glass is only decorated with scratched rings, strokes and ovals, cross stroked on the inside, a rude ornament which is the forerunner of decay; in the Middle Ages, with only a small production of glass, engraving ceased altogether for the time being.

The Romans most probably did not make use of a diamond for engraving, but of a piece of flint. Instead of scratching lines another method of engraving is used in exceptional cases by speckling, but the points or dots are not really engraved, but drilled in the glass. The effect is therefore different from the stipple-engraving of modern times.

In the Middle Ages engraving on glass is only occasionally applied for inscribing a name or a sentence, not for decoration.

The Renaissance brought a new florescence of the art of engraving. Not improbably this was a consequence of the greater interest shown at this time for objects cut in rock crystal, for which a decoration engraved by hand or wheel was nearly inevitable to cover the dull spots in the stone. Venetian glass of the 15th century and the beginning of the 16th century was not so clear that nothing had to be concealed. Therefore the glass was mostly coloured, either in the metal or covered with enamelled decorations; but in the 16th century there came a change of taste, and clear glass was preferred with less variegated ornaments. This change of taste was international, as is shown by the following quotation from the Bohemian priest and glass expert, Johannes Mathesius, who wrote in 1562: " Formerly the churches had stained windows, but now colourless glass is common, on which white threads are drawn with white enamel and which are said to be made in Silesia, in the same way as nowadays all sorts of festooning and handsome lines are drawn by diamond on the nice and bright Venetian Glasses " (*Die XV Predigt vom Glaszmachen*, p. 195 verso).

It is pretty sure that this new custom was practised first at Venice itself and that the technique of diamond engraving on glass is a Venetian invention. Many examples of early Venetian diamond engraving have survived. Often this decoration is combined with gilding or with watercolour painting. The older pieces always show regular, outlined borders with arabesque-like leaves and scrolls, or simple flowers, drawn in outline and filled in with parallel scratches.

In the 17th century the way of engraving is altered; the forms are then more naturalistic and less carefully drawn. We find it on colourless, but more often on violet, glasses.

The Muranese and Altarists, who brought the art of blowing light and colourless glasses to the North, must also have divulged the art of engraving —at least, we find in the 16th century a similar style in all countries where Venetian glass is made. In Liége it is confirmed by documents that the Altarists, Buzzone and Castellano, have introduced the art of engraving. At Hall in the Tyrol Venetian glass was made from 1534 onwards. Although the forms of the glasses made here are adapted to the wants of the country, and therefore differ from the Venetian, the engraving is quite similar to what is made in Venice at this time; it consists of scrolls and leaves in arabesque style combined with gilding and watercolours. Venetian artists must also have been the originators here. The engraved decoration on Verzelini's glasses in England have certainly been made by his Italian hands. Also in Bohemia, in Silesia, in Saxony and Bavaria we find the Venetian way of engraving. This lasts until the end of the century, by which time probably the natives of each country have got the skill to imitate their Italian teachers and bring their national character into the work.

In Holland the art of making Venetian glass is imported towards 1600. Some dated pieces are of this period, and as engraving was needed for putting a date on, they are at the same time the oldest dated examples of Dutch engraving. A flute of 1600 with the coat of arms of the Seven Provinces (Rijks Museum, Amsterdam) (Figs. A and B) and the famous tall beaker with the confrontation of Pope and Christ and Dutch verses (Rijks Museum, Amsterdam) still show the Venetian style, with strong outlines in arabesque form, filled in with separately drawn parallel strokes. The latter, as a rule, lie a certain distance from each other, so as not to diminish the transparency of the glass.

This special way of engraving in all countries hardly outlives the 16th century. In the 17th century the pure decorative element is replaced by more realistic figures. In most countries diamond engraving then loses importance. In Murano the glass maker tries to give excentric forms to the glass itself, instead of afterwards adding decorations; this way is followed by Spain and France. In Bohemia and Silesia the easier and quicker wheel-engraving soon replaces the diamond work. In Southern Germany enamelled decorations are preferred. Holland makes an exception, where during the whole century engraving is continued,[1] not so much as a profession, but more as an elegant pastime for patricians closely connected with other humanistic dilettantism in art. Owing to this circumstance we have a little more information about the workers in this art than generally is the case with professional artists and craftsmen of former ages. As a rule, each piece was destined as a present, and for this reason it often was signed and dated. This fact also accounts for the different forms of glasses which were chosen. They never formed a set, but each one was a work of art in itself, and variation of form was an additional attraction. The glasses used in Holland in this time were roemers of green metal and thin soda-glasses of varied forms, such as those introduced by the Venetians. Both kinds were made in Holland, during the whole century, in various manufactories in different towns. The engravers looked for showy pieces; exceptionally large, or very small

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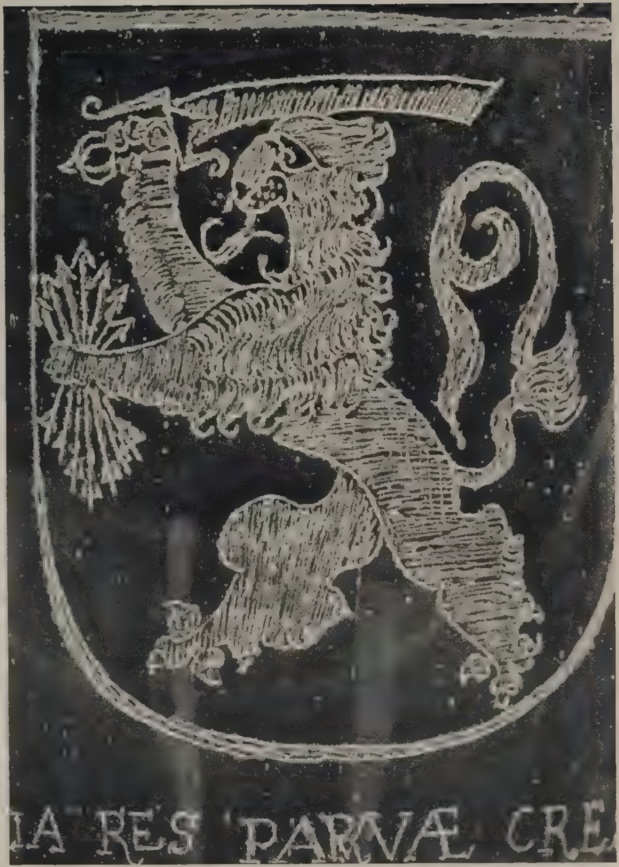
[1] Though certainly Holland ranks first amongst the engraving countries during the 17th century, I do not see why, following Hartshorne's example, all engraved glasses, even those found in England with English inscriptions, should be ascribed to Dutch artists. There is no reason why in London there should not be some good engravers, as well as, for example, it is proved in Cologne.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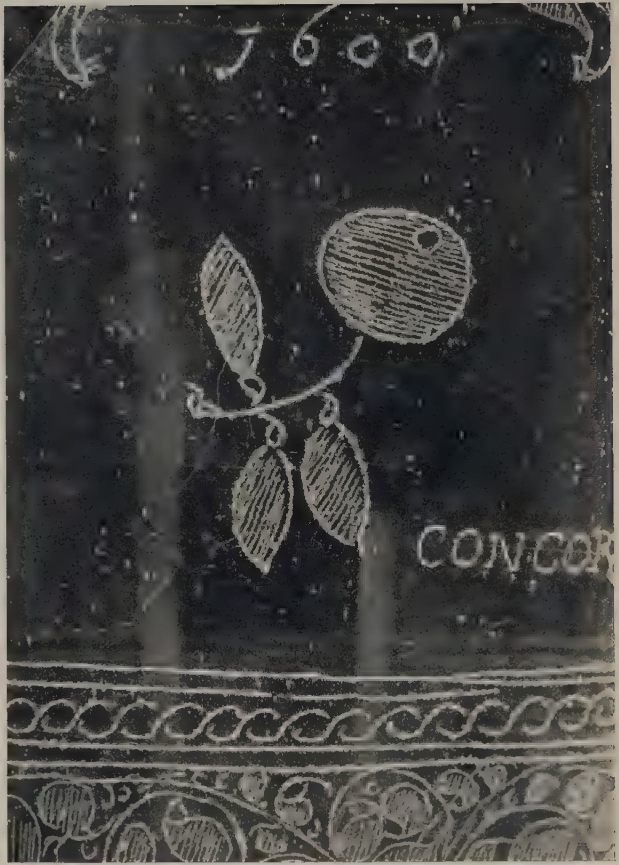
A (magnified 6 times). Dated 1600.


1600
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B (magnified 6 times). Dated 1600.

roemers; clear and elegant Venetian glasses; tall flutes, handsome goblets and beakers, or stately chalices with covers; also green, violet, blue or colourless bottles and decanters.

The oldest glass with a Dutch-engraved inscription is a beaker of 1581 in the collection of Mrs. Snouck Hurgronje at The Hague.[1] Second in date is a glass horn with gilt edges in the Rijks Museum, Amsterdam. It bears three inscriptions by different hands. The first, in Latin, with the monogram "D V C" and no date. The second, with the name of Reynier Cant, burgomaster of Amsterdam from 1580–1595, is dated 1590, in which year Cant was appointed counsellor to Prince Maurice of Orange. The third, with the name of Cant's grandson, Franck van der Meer, burgomaster of Amsterdam in 1652, is a *chronikon*, which gives the year 1652. The horn must date from 1590 or earlier. Then follows a flute with a silver mill attached to it, with the coat of arms and device of Prince Maurice of Orange dated 1595 (Coll. Mrs. Fuld, Amsterdam). A (broken) flute in the Rijks Museum, Amsterdam, engraved with the lion of the United Dutch Provinces, bears the date 1600 (Figs. A and B). Shortly afterwards the tall beaker was made with the satirical confrontation of Pope and Christ with Dutch verses, after a German print largely known and reproduced in Holland. It is one of the masterpieces of early diamond engraving, dated 1604 (Rijks Museum, Amsterdam). This and the former piece still show the Venetian way of engraving: regularly outlined figures, filled in with separate parallel lines at equal distances, accompanied by arabesque-like scrolls. Some large green roemers in the Rijks Museum, Amsterdam, with the coats of arms of Prince Maurice of Orange, are dated 1606 and 1608. They also show the Venetian style, but it is more freely adapted to the purpose. The arabesques, which are characteristic of the Renaissance, in which period ornament was handled with the greatest ease and surety, are now suppressed and are supplanted by realistic ornaments or dissolved in flowing baroque lines.

Taken generally, the Dutch diamond engraving of the first half of the 17th century is of a light transparent character (Fig. C). Cross scratching is only used for the high lights, and as a rule dead opaque spots are avoided. But a difference from the former style may be noticed already in the glasses of 1606 and 1608, in the way the scratchings of the filling lines go up and down and zigzag, as well as in spirals.

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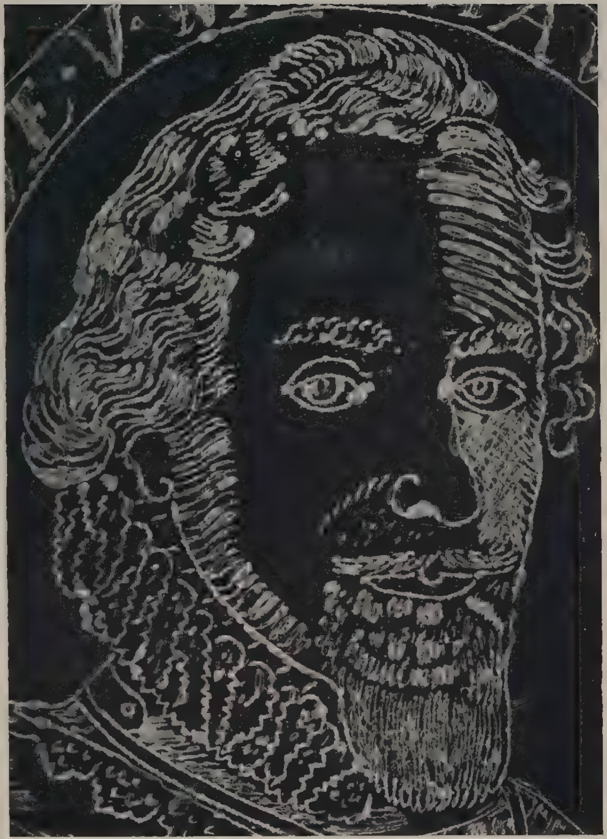
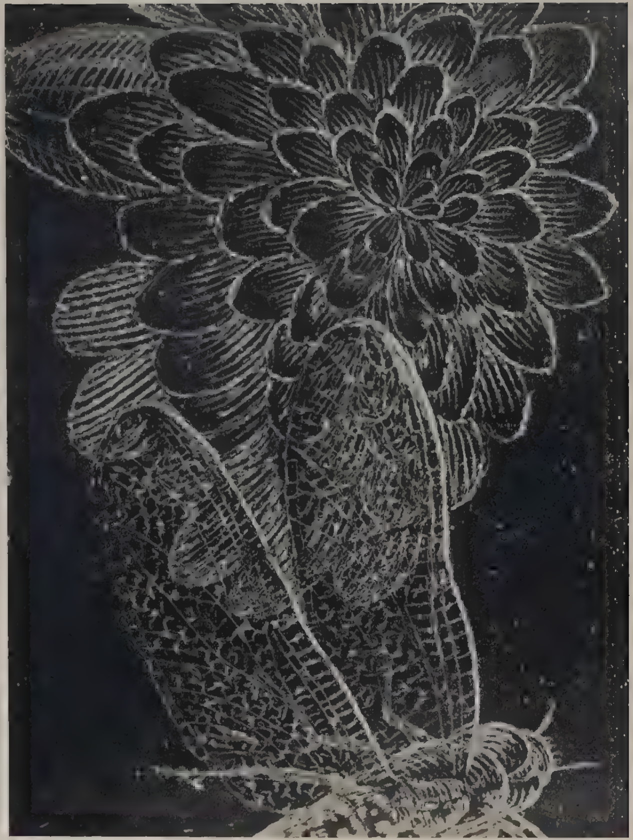
[1] A chalice with Dutch heraldry and garlands in the Boymans Museum, Rotterdam, dated 1529 must have been made at least a century later.

The Dutch diamond engraving of this period reaches its highest point in the work of Anna Roemers Visscher, who with her sister, Maria Tesselschade, was one of the best known intellectual women of her time. Anna Maria van Schurman, about twenty years younger than Anna Roemers, and equally famous for her intellectual endowments, also claims the merit of an excellent diamond engraver. The foremost poets of the time celebrate in song the art of these learned women. One glass decorated by *Anna Maria van Schurman* exists, a huge dark green beaker, with calligraphical inscription and flying insects, fully signed (Rijks Museum, Amsterdam). Another glass of clear metal with calligraphy bears the monogram "AMS," and may, on stylistic grounds, be ascribed to her. Both glasses show a complete mastership of the diamond. Only one glass by *Maria Tesselschade Roemers Visscher* remains, a roemer with calligraphical inscription (Rijks Museum, Amsterdam); it is not signed, but the origin is sufficiently proved by documents. Of *Anna Roemers*' famous work we have four signed specimens. A charming small roemer of clear green glass, with flowers and insects and an Italian couplet, dated 1621 (Rijks Museum, Amsterdam); a larger roemer in Hamburg (Museum für Kunst und Gewerbe), dated 1642, with her device in Dutch, Latin, and Greek in calligraphy; a wide roemer (Rijks Museum, Amsterdam) with the words "Vincens tui" and fruit and insects of 1646: and a large roemer (Boymans Museum, Rotterdam) with the calligraphical inscription "Beati sunt Pacifici." In diamond engraving Anna Roemers has not been surpassed. Her stroke is decided, pure and neat, and at the same time very light. She combines the utmost expressiveness with the greatest possible transparency (Fig. D). Her calligraphy is sober but irreproachable, and the flowers, fruit, and insects she reproduces are fresh and sprightly. Still she did not take these subjects directly from nature. They are all derived from prints in natural history booklets, such as were edited at the end of the 16th century by Londerseel and Van Boesecom, with engravings by Adriaen Collaert and Nicolaes de Bruyn. Following this track I was able to ascribe another glass in the Rijks Museum to her hand: a goblet with a decoration of birds and insects.

As a rule it may be said that all the representations engraved on glasses have their model either in print or in drawing. It is not always easy to find the originals, but the many times I have hit on them have brought me to this conclusion. Very often those originals are followed with such an accuracy that the surmise is justified that the outlines have been projected on the glass by some means or other before the engraving was



C (magnified 6 times). *Circa* 1608.



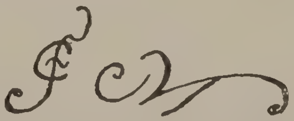
D (magnified 8 times). Dated 1621.

started. With the question of etching I shall deal further on; in any case, etching on glass is excluded in these early times; there remains the possibility of fixing the models inside or outside the glass for the preliminary operations. I cannot deny this with certainty, but still it seems to me very improbable, especially in the 17th century, when engraving is fluent and easy, and does not show the anxiousness of certain pieces made nearer to our times.

A technical singularity in the work of Anna Roemers is the way in which she has modelled a cherry on the glass of 1646. She must have put her diamond point vertically on the glass, making the light part by a conglomeration of dots (Fig. E). This method was not followed until a century later, when it led to the invention of the stipple engraving to which Wolff has given its name.

As already said, the principal characteristic of diamond engraving in the first half of the 17th century is its transparency. In the second half of the century Dutch diamond engraving was apparently influenced by the competition of wheel engraving, then introduced from Germany. The diamond engraving is not set aside at once, but it tries to imitate the effect so easily obtained by the wheel. A contrast between dark and light, between clear and dead parts is aimed at, a stronger but a coarser effect. The dead parts are brought about by narrowly joined scratches, by strokes and cross strokes, put so close together that even an enlargement does not show any opening (Fig. F). By putting the strokes in different directions the effects of the deep and shallow parts of wheel-engraving are imitated.

We can observe this new treatment on a great number of glasses with portraits and other figures, amongst which there is a group of outstanding excellence, which easily may be gathered round a number of pieces with a monogram and date. It is composed of roemers as well as of clear crystalline glasses in Venetian style. The monogram has been explained by Dr. H. E. van Gelder as belonging to Christoffel Jansz. Meier, a "glasschrijver" of The Hague. I have two arguments against this hypothesis. In the first place, the word "glasschrijver," which nowadays one is tempted to translate as a writer on glass, in the 17th century was the usual term for a maker of stained glass, but not for an engraver or glass-cutter. Of course, a maker of stained glass could have engraved as well, but I do not read the monogram as "C.J.M.," but as "C. F. M."



The earliest piece by this artist is a roemer, dated 1644 (Rijks Museum, Amsterdam), with representations of Haarlem, after prints of Matham and Akersloot in Ampzing's *Beschrijvinge van Haarlem*. Other glasses of his are a crystalline goblet with an allegory on true and corruptible love, dated 1652 (Rijks Museum, Amsterdam); a roemer with the Birth of Christ and the Flight into Egypt of 1652 (Museum Willet Holthuysen, Amsterdam); a flute with the portrait of William III of Orange, as a child (Fig. F) (Rijks Museum, Amsterdam), after a picture by Gerrit van Honthorst, reproduced in several prints, with monogram, but not dated—this must belong to this period, as the Prince was born in 1650; a glass with angels and the portrait of a princess of Orange, probably Louise Henriette, daughter of Frederic Henry and wife of Frederic William of Brandenburg, dated 1655 (Ettersburg Castle, Weimar); next is a flute with the portrait of her husband, dated 1659 (Coll. Mrs. Snouck Hurgronje, The Hague); a roemer of 1660 is decorated with the coat of arms of The Hague (Mun. Museum, The Hague). The last is a crystalline goblet with a falconry scene, dated 1661 (Museum Willet Holthuysen, Amsterdam). These glasses, to which a good many unsigned might be added, belong to the masterpieces of diamond engraving of this period.

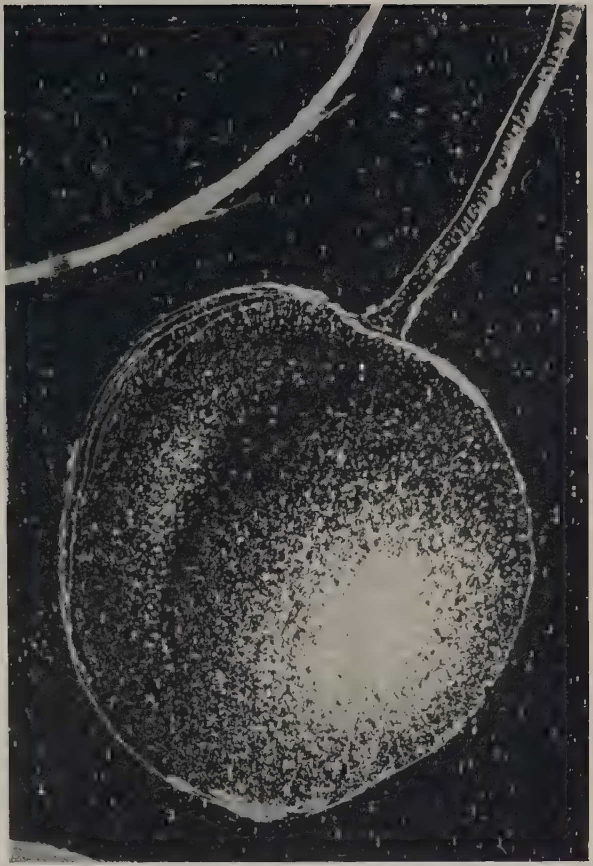
Related to these are: a goblet with allusions to love (Coll. Wilfred Buckley, No. 56), a goblet with figures of young Bacchus, after prints of Matham (Rijks Museum, Amsterdam), and a cylindrical glass with dwarfs (Museum Willet Holthuysen, Amsterdam).

From a different hand, but equal in quality, are a series of flutes with portraits of William III of Orange at different ages (Coll. Wilfred Buckley, No. 58, and Rijks Museum, Amsterdam).

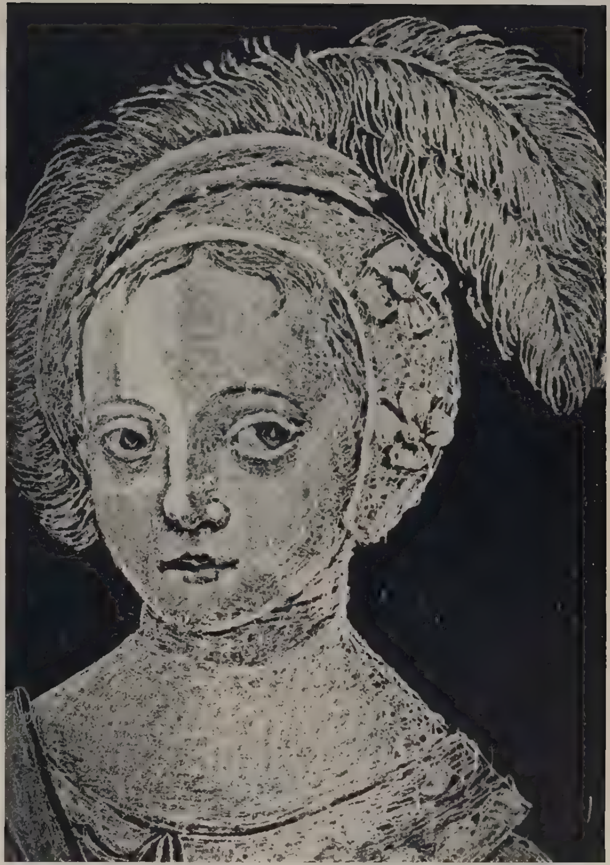
Fully signed pieces of the second half of the 17th century are more rare.

In the Museum Willet Holthuysen, Amsterdam, there is a goblet with a symbolical landscape and figures, signed *Stampioen fecit*, 1656. A dragon-fly on this glass is very similar to the insects engraved by Anna Roemers, but the engraving is careless and shows the dead parts, typical of the second half of the century. Perhaps a very large roemer in the Rijks Museum is decorated by the same hand with a whale and other animals, which in *Oud-Holland* (XLI, p. 183) I ascribed wrongly to Anna Roemers Visscher.

M. van Gelder shows himself a great artist in the decoration of a large roemer signed with his name and dated 1659 (Museum Boymans, Rotterdam). It shows dancing and fighting peasants after prints of Callot of



E (magnified 12 times). Dated 1646.



F (magnified 6 times). *Circa* 1653.

the series " Varie Figure Gobbe " with the coats of arms of Rotterdam and its Admiralty and of the Prince of Orange, and an inscription, commencing (translated) : " This glass is king of all the glasses," etc. The nice cover with high knob is engraved with vine branches. In the sale of the Coll. Lefrancq van Berkhey in 1783 there was another glass of Venetian type, engraved with dancing bears and signed M. M. van Gelder, 1673.

Johannis Tijbout, 1672, signed a large roemer (Sypesteyn Castle, Loosdrecht) with a portrait of William III of Orange, a cavalry battle and several symbolical figures with inscriptions alluding to the complicated political events of this year.

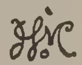
C. Koster is the engraver of a crystalline glass with the portrait of one of the Orange princes (Coll. Mrs. Snouck Hurgronje, The Hague).

De L'hommel signed a roemer of 1661 with the arms of The Hague (Mun. Museum, The Hague).

A dish with a rustic scene (Victoria and Albert Museum, South Kensington) is signed *J. Wolf*, 1663.

A number of flutes and roemers with portraits of the princes of Orange, e.g. Frederick Henry (Rijks Museum, Amsterdam), William II (Rijks Museum, Amsterdam), William III (Coll. Wilfred Buckley), and Frederic William of Brandenburg (Museum Willet Holthuysen, Amsterdam), are treated in the same way with dead and clear spaces, at least as far as the faces are concerned ; the further decoration, consisting of flowers, leaves, and birds, is more transparent, but the fillings are obviously slovenly. The same thing may be said of most glasses and of blue, violet, and colourless bottles, decorated with flowers, birds, and vine-branches, of the middle of the 17th century (Fig. K, see also Coll. Wilfred Buckley, No. 65A).[1]

Much of this work certainly comes from a small group of makers : a good number may even be ascribed to a single hand. Such are the engravings of which some are signed with the following monogram : This monogram stands for *W. Mooleyser* of Rotterdam. Two glasses of his are fully signed. One is a beaker (Coll. Wilfred Buckley, No. 62B, formerly Coll. Alma Tadema) decorated with dancing and drinking peasants in the style of the etchings of Pieter Nolpe ; it is dated 1685. The other one, a goblet (Museum Boymans, Rotterdam) with similar subjects, is dated 1686. A goblet in the Rijks Museum, Amsterdam, similarly decorated, bears the mono-



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[1] It may be useful to draw attention to the fact that this kind of glasses and, especially, of bottles, engraved with birds and flowers, has been very cleverly counterfeited in the 19th century. Forgeries of 17th-century engraved glasses, even signed and dated, are not rare but, as a rule, they can easily be distinguished from genuine pieces.

gram and the date 1685. Earlier in date is a large roemer (in a private collection) with the coats of arms of the United Provinces and of William III and of Princess Mary, it bears the monogram and the date 1682. A bowl with the monogram and dated 1697 shows an allegory on the Peace of Rijswijk (Rijks Museum, Amsterdam). An eagle on this piece is formed out of a single flourish, a favourite trick of calligraphers of the time. Mooleyser likes these curling lines. Although he seems to be one of the most productive artists, he does not merit the great praise which Hartshorne has bestowed upon his work. His hand is rather crude and careless, but there is some force and spirit in his engraving. Many glasses, although not signed, may be identified with certainty as Mooleyser's work: a goblet (Rijks Museum, Amsterdam) with the portrait of William III; a flute in the Museum Willet Holthuysen, with a colour-sergeant and the inscription "T'welvaren van de crysraet 1666"; a goblet to the welfare of a fishery, dated 1683 (Rijks Museum, Amsterdam); a glass inscribed "Hansie in de Kelder" (Rijks Museum, Amsterdam); a goblet with the portrait of William III and another with the Orange coat of arms (Rijks Museum, Amsterdam); a winged goblet with children and flowers, dated 1685 (Coll. Mühsam, Berlin); a glass with dancing peasants (Coll. Six, Amsterdam); one referring to the welfare of the West Indian Company (Museum Oud-Dordrecht); four glasses with calligraphical inscriptions (Rijks Museum, Amsterdam, Boymans Museum, Rotterdam, Coll. Six, Amsterdam, Coll. Wilfred Buckley (No. 62A)), and three with the coats of arms of Holland and the United Provinces (Rijks Museum, Amsterdam).

The glass on which *Charlotte van Santen* engraved a female figure, celebrated in a song by Constantijn Huygens, is lost, alas! with so many others.

Here I must mention a curious group of glasses of the last decade of the 17th century, mostly decorated with wheel-engraving, to which belongs a glass engraved with a diamond with coats of arms and inscriptions (Museum Lakenhal, Leiden), originating from the St. Catherine's Hospital at Leiden. The engraving has no eminent qualities, but the glass itself is interesting because of its form. It has a tall stem with two hollow, lobed knops. The bottom of the cup is decorated with raised ribs in the form of pincers. Similar ribs also decorate the cover, which is surmounted by a ring. I have found several of these glasses in different collections. They belong to a strongly modified Venetian type and, as they are all decomposing, they must come from a single factory, where a mistake was made in the chemical composition of the metal. Most of the decorated pieces have coats of arms, allegories or inscriptions concerning King William III and the Northern Netherlands. They must therefore be considered as the first examples of Dutch engraving with the wheel, the forerunners of the hundreds of glasses decorated in this way in Holland in the following century (see No. 63). The earliest glass with probably Dutch wheel-engraving is a winged goblet representing the Dutch victory over a Swedish fleet dated 1659 (Museum Oud-Dordrecht).

An important place amongst the 17th-century Dutch engravers on glass should be given to the calligraphers, both professionals and dilettantes, but the latter form the majority. Pithy sentences with elegant flourishes are entrusted to the glass. The calligraphers have a certain preference for bottles of coloured glass, green, violet or blue; but also a good many crystalline glasses bear their inscriptions. The sisters *Roemers Visscher* and *Anna Maria van Schurman* had their part in it (Rijks Museum, Amsterdam; Boymans Museum, Rotterdam; Museum für Kunst und Gewerbe, Hamburg). *Van Buil* (1655, Rijks Museum, Amsterdam), *Elizabeth Crama* (1678, Coll. Mrs. Snouck Hurgronje, The Hague; 1692, British Museum), the writing master *Petit* of Leiden (1687, Rijks Museum, Amsterdam, and Boymans Museum, Rotterdam), and *B. Boers* of Warmond near Leiden (1687, Boymans Museum, Rotterdam; 1690, in commerce; 1694, Coll. Six and Rijks Museum, Amsterdam) left their names on some of their masterpieces. But the best known and the most productive amongst them all is Willem van Heemskerk.

Willem Jacobsz van Heemskerk was a cloth manufacturer of Leiden; he lived from 1613 to 1692. In his leisure hours he was not only calligrapher, but also poet. In 1647 a tragedy he composed was presented in the theatre of Amsterdam. He used to explain the sentences which he wrote on his glasses by a longer poem, written in minute characters underneath the bottom of the glass or bottle. To this poetical explanation he added his name, the date, and his age, so that we are well informed about his work. His face is known to us as well, as he has been twice portrayed, once as a cloth-hallmaster in the " Staalmeesters " of Leiden by J. de Baen, 1675, and once by Jan van Mieris in 1687, a picture which has been reproduced in mezzotint by Abraham Blooteling. His calligraphy shows Latin and Gothic characters in script and block letters, between an abundancy of supple flourishes. Although there is plenty of variety in it, his handwriting is easily recognizable. Only few pieces date from his earlier years. The first is a roemer, with the sentence " Kent U zelven," of 1648 (Museum

Lakenhal, Leiden). The bulk of his work is dated from 1672 onwards. There are a good many glasses and bottles which clearly show his hand, but which are not signed or dated. It is therefore possible that he took up the custom of dating and signing every piece only after 1672. The Rijks Museum at Amsterdam possesses seventeen signed and dated pieces by his hand, mostly bottles, but also goblets and beakers, and two large dishes; also nine unsigned pieces, amongst which there is another dish. Ten signed pieces are in the Museum Lakenhal at Leiden, and others in the Coll. Mrs. Snouck Hurgronje; the British Museum; the Coll. Wilfred Buckley (Nos. 61A and 61B); Gemeentelandshuis van Rijnland, Leiden; Boymans Museum, Rotterdam; Kunstgewerbe Museum, Berlin, etc. A small bottle in the Rijks Museum shows that engraving was done as a pastime; next to Heemskerk's signature is written *navigans;* obviously he had put it in his pocket and worked at it when travelling in a passenger canal barge. On a beaker of 1679 in Rotterdam he inscribed the same word. He still worked with the diamond at a great age. One of the bottles in the Coll. Wilfred Buckley (No. 61B) is dated 1684, when Heemskerk was seventy-one years old. A bottle in the Rijks Museum bears under the bottom two verses which, translated, read:—

> "If all this scratching is not straight and bold
> Think Heemskerk's eye and hand are getting old."

And still in 1690, when he was seventy-seven, he dated a piece (Museum Lakenhal, Leiden) with the inscription "wat uyr stelt maet" (which hour will draw the line). The hour came two years later.

There is a glass in the Coll. Mrs. Snouck Hurgronje, with the inscription "maet houdt staet," which is signed *Jacob van Heemskerk*, 1682. It may be that this is a son of Willem, although I have not found his name anywhere else.

The eighteenth century brings a great change in the decoration of glass in Holland. The reason for it must be found in the introduction of the heavy lead-glass, which soon everywhere takes the place of the thinner, but less brilliant, soda-glass. The expressive wheel-engraving now gets the better of the diamond and even threatens to supplant it altogether. There still remain some diamond engravers, but in number, as well as in artistic significance, they only occupy an unpretentious place.

T. van Borckeloo (1736, Centraal Museum, Utrecht), *A. C. Schonck* (1753, Rijks Museum, Amsterdam), *A. F. â Schurman* (a prebendary of

Antwerp, whose glasses of 1758 are in Amsterdam and Rotterdam), *H. Zweerts* (1762, Rijks Museum, Amsterdam), *R. Goudtsbergen* (1771 and 1772, Rijks Museum, Amsterdam), *H. Emaus* (1775, priv. coll.), and *M. J. Ellinkhuysen* (1783), are not worthy of great praise.

Amongst the calligraphers the first place must be given to *H. F. Scholting*, a blacksmith of Dordrecht, whose seven goblets and several panes are in the Museum Oud-Dordrecht, dated from 1747 to 1750. There are other dated pieces in Rotterdam (1748 and 1764, Museum Boymans), Leiden (1748, Lakenhal) and Amsterdam (1763, Rijks Museum). But neither he nor *H. Van Lockhorst* (1753, Rijks Museum, Amsterdam; 1765, Coll. Wilfred Buckley No. 76B) can stand comparison with Willem van Heemskerk and others of his time.

Besides these descendants of the old tradition there is a new generation of artists in the 18th century, which has adapted its methods to the new metal, and which, instead of competing with wheel-engraving, goes its own ways.

We must be well aware that at this time new methods arose also in the way of engraving copper plates for printing, and that this new movement also started in Holland. The punch-engraving method had its chief representative in Jan Lutma the Younger, of Amsterdam; and the mezzotint, which also is produced by a conglomeration of dots and flicks, was a Dutch invention and was practised in the beginning principally in Holland. Then comes, in the second half of the 18th century, the stipple method, for which Bylaert of Leiden laid the foundation. The path from these methods to stippling on glass is not a long one, and we cannot be astonished that mezzotints are taken as models by the first stipplers on glass, since a maker of mezzotints is also one of the principal initiators of the new kind of glass-engraving.

Although on many occasions the words of Hartshorne, who simply says of all glasses to which the new method has been applied, " stippled by the means of fluoric acid," have been refuted, it may be useful to repeat the refutation, because stippled glasses are confused still continuously with those that are etched. Etching on glass with hydrofluoric acid is an invention of the end of the 18th century. Scheele (1742–1786) and Priestley (1733–1804) alone have indicated methods to obtain hydrofluoric acid, which combines with the silicic acid of the glass and forms the volatile silicium-fluoride. (When hydrofluoric acid is applied to glass as a gas, the etching becomes dead; if it is first rarefied with water, then the glass remains brilliant after etching.) How far the etching method, which

*a**

Schwanhardt in Nuremberg is said to have invented about 1670, was of practical use is not known; in any case, until now no glass has been found before the 19th century which with any certainty may be said to be etched.

The best proof that no etching was needed for stippling on glass is in the work of Anna Roemers (Fig. E), who stippled as early as 1646, which is twenty-four years before Schwanhardt's doubtful invention. Another proof may be the unfinished stippled figure on an 18th-century glass in the Rijks Museum (Fig. G), of which the outlines and other principal lines have been stippled first, to be filled in later on. For an etcher there would be no reason for drawing in this way, but if he did, he would not make use of his corrosives to complete the head and leave the other parts unfinished. Moreover, documentary evidence, as well as close inspection, positively shows that the work was done by hand only. Further on I shall quote some passages in which the art of one of the principal stipplers is called by contemporaries diamond work. Concerning Wolff's method, a note in the *Navorscher* of 1853 (p. 217) says that an old man, who had known Wolff and had seen him working, said that he used an etching needle, but that he drove this into the glass with a little hammer, which of course he would not have done if he were etching afterwards.

Greenwood was the first who applied the stippling method after Anna Roemers. *Frans Greenwood* was born at Rotterdam in 1680; he married Marie van den Hoolaart. In 1726 he was nominated civil officer in Dordrecht. From that time onwards he lived in Dordrecht and died there in 1761 or 1762. His son, Cornelis Greenwood, was a painter and was a friend of the painter and engraver Aert Schouman. Frans Greenwood was a humanist, like Heemskerk, an amateur of fine arts, poet, miniaturist, collector of curiosities. From his collection came the executioner's sword, now in the Rijks Museum, with which the famous statesman Johan van Oldenbarnevelt is said to have been beheaded. A book belongs with this relic, in which all visitors to Greenwood's cabinet had to write a poem about its cruelty. J. van Gool,[1] who was Greenwood's contemporary, calls him the inventor of stippling on glass. "He has invented," he says, "a curious method, never seen before, of drawing on wine glasses with a *diamond*, not according to the well-known art of cutting, where the shadows are cross-engraved and where the pure glass represents the highest light, but just the contrary; with him the drawn parts give the highest lights, and the pure glass the shadows, just as if one drew with white chalk on red, black or brown paper, very agreeable to the eye, if it is well done;

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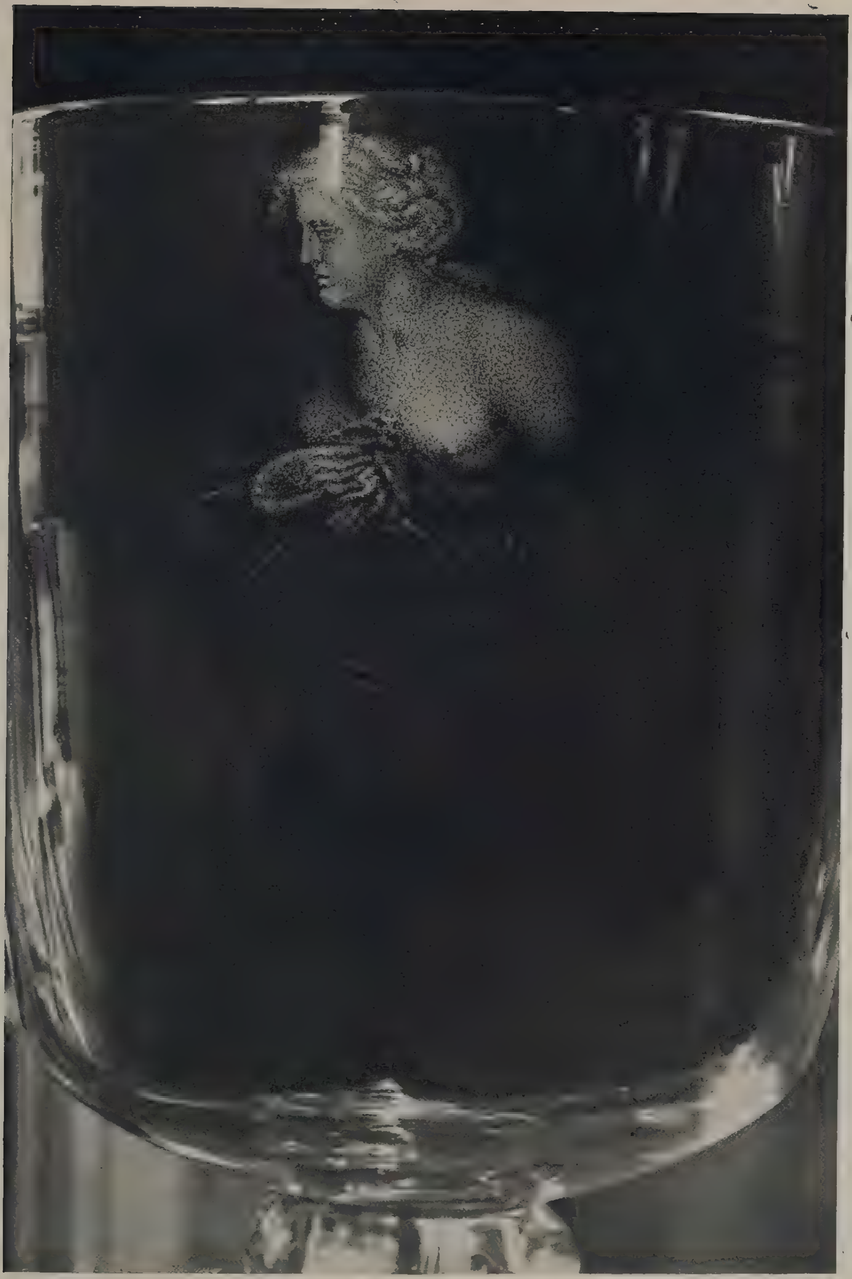
[1] *De Nieuwe Schouburg der Nederlandsche Kunstschilders*, 1751, II, p. 343.



G (somewhat enlarged). End of 18th century.

but it takes much time, patience and skill, therefore it will not easily be imitated by others, be it just as an amusement, because it has to be well paid for, to make profit out of it, and this is seldom the case in our times." His poet friends also celebrate his diamond. Hoogvliet writes: "He who gave life to Vondel on my drinking glass"; evidently Greenwood had stippled a portrait of the poet Joost van den Vondel on it. Another poet, D. Smits, writes: "But nicer still his spirit portrays itself with the diamond point on beakers of glass." These verses accompany Greenwood's portraits, of which several have been made. His son Cornelis made a miniature of him for the Panpoeticon Batavum of 1740. Aert Schouman made a watercolour portrait, and from this a mezzotint. Jelgerhuis made another mezzotint. Here we see already that Greenwood was connected with the makers of mezzotints; he probably saw them at work, and this might have given him the idea for his new procedure.

In the case of Greenwood's earliest glass (Coll. Wilfred Buckley, No. 67), dated 1720, he does not yet use stippling, but simply scratches with a diamond. It shows some Italian comedians, from the series of etchings by Callot, known by the name of Cucurucu (Meaume, 641/664). But already by 1722 his glasses (Coll. Six, Amsterdam; Kunstgewerbe Museum, Berlin; Fredericianum, Cassel) are all in stippling. His method is in so far different from that of Anna Roemers, that he does not only stipple those parts which are specially adapted for it, but his whole design is composed of dots, only helped by a single scratch in parts, where he could not do without, for example, in the eyes. His dots are pretty big and far from each other and put in with force. He treats his figures as he would if he were painting; that is to say, he puts them on a stippled background. Only a few glasses are exceptions to this.

I have come across eighteen glasses inscribed with his name, but I assume there are still a good many more. Besides the four above mentioned of 1720 and 1722, there are: one in the Rijks Museum, Amsterdam, of 1724; a second in the Coll. Wilfred Buckley, of 1728 (No. 68); one in the Coll. Mühsam, Berlin, of 1728; two in the Museum Boymans, Rotterdam, of 1730 and 1742; one in the Rijks Museum, Amsterdam, of 1743; one in the Museum für Kunst und Gewerbe, Hamburg, of 1746; one in the Mun. Museum, Arnhem, of 1746; one in Nuremberg, of 1746; one in the Boymans Museum, Rotterdam, of 1748; one in the Coll. Mühsam, Berlin, of 1749; one in the Coll. Schiffer, Amsterdam; two undated glasses in the British Museum and an undated one in the Coll. Sir John Risley. Most of them show a single figure to the waist: men with a glass or a pipe in their hand, like so many mezzotints of this time by Abraham Blooteling and others, after 17th-century painters, such as Van Mieris, Toornvliet, and Roestraten. Others have female figures. One shows Bacchus, another Apollo, and a third a lyre, these two probably made for his poet friends. A famous glass, stippled all round with the Goddess of the river Maas in a nice garden, was formerly in the Coll. Steengracht in The Hague, but now belongs to the Coll. Mühsam in Berlin. The example in the Coll. Six bears an allegory on painting. Some show only a rose and a butterfly, a reminiscence of the 17th-century glasses of Anna Roemers. (Besides the two in Nuremberg and Berlin, a third one with this subject is in the Rijks Museum; it lacks its foot, which may be the reason that it is not signed.)

Well acquainted with Greenwood, and certainly his pupil in the art of stippling, was *Aert Schouman* (1720–1792), a well-known painter and engraver, who was born in Dordrecht and worked at The Hague. He made mezzotints after Dou, Van Loo, Frans Hals, Potter, Schalcken, and others. His way of stippling on glass is similar to that of Greenwood, and as a draughtsman he surpasses his master; but in the first piece we know by him (a portrait of William IV of Orange in the Rijks Museum, Amsterdam, of 1750) he nearly overdoes himself in bluffing with his capacities. The portrait is placed as a real picture between other objects in a still-life. A glass in the Coll. Wilfred Buckley, No. 71, shows an allegory of the death of William IV, and is dated 1752. Here the illusionistic way is still more exaggerated, so that the subject seems to soar in the cup. This sort of jugglery in art was a mode of the time. Jacob de Witt excelled in it in his famous dessus-de-portes, imitating sculpture in grey painting. On a glass of 1751 Schouman placed the figure of a man against a stippled background, as Greenwood used to do. Schouman's dots are pretty thick, like those of Greenwood. Sometimes he scratches a line amongst his dots. Four signed and dated glasses by Schouman are known: William IV, 1750; a man with a stone bottle, 1751 (both Rijks Museum, Amsterdam); an allegory of painting (Municipal Museum, The Hague); and an allegory of the death of William IV, 1752 (Coll. Wilfred Buckley, No. 71).

With *G. H. Hoolaart* we reach a third generation. He may have been the son of a glass painter and engraver of this name in Dordrecht, and perhaps he was a nephew of Greenwood, whose wife's name was Van den Hoolaart, too. His glasses are the only documents by which we know him. One is signed and dated "G. H. Hoolaart, 1775" (Rijks Museum, Amsterdam); it shows a cow in a landscape. As this glass was made fourteen years after Greenwood's death we can hardly speak of his being a pupil at that time. In any case, although he also uses the stippled background, and the strong way of stippling like Greenwood and Schouman, his glasses are easily recognized, because he leaves the unelaborated shadow parts much larger, which makes his figures show up like silhouettes. I know five glasses by his hand: the glass dated 1775, with the cow, signed " G. H. Hoolaart " (Rijks Museum, Amsterdam); a glass with an allegory and a poem on an orphanage (Museum Oud-Dordrecht) signed " G. H. Hoolaart, Dordrecht, 1775 "; a glass with a half length picture of a peasant and his wife, signed " G. H. Hoolaart " (Rijks Museum, Amsterdam); a glass with the portrait of a man, signed " G. H. H." (Coll. Wilfred Buckley, No. 79); and a glass with a man smoking, signed also " G. H. H." (Museum Boymans, Rotterdam).

Several artists compete for the first rank in the peculiar kind of work which later on became the speciality of Wolff.

Willem Fortuyn is only known by a single glass, signed and dated 1757 (Rijks Museum, Amsterdam). A lady plays the spinet in the company of a gentleman. This scene is framed by rocaille ornament, musical instruments, and garlands. Here stippling and engraving are mixed; all the outlines are done by thin engraving, and the stippling is done more in short strokes than in real dots. In the ornaments the influence of wheel-engraving is obvious. In all this Fortuyn is very different from what we know of Wolff. But Mr. Schmidt ascribes to him two glasses in Coll. Mühsam, Berlin, which really could be a bridge between the two, although I hesitate to accept his hypothesis.

Another artist who might have been the initiator of the new art, for which generally Wolff's name is used, is *J. van den Blijk*. If he deserves this fame, he was a better inventor than a draughtsman, because his drawing is far beneath his other talents in this art.

If really the glass in Mr. Buckley's collection (No. 72) is dated 1756 (of which I doubt, because the decisive " 5 " might just as well be an " 8 "), Van den Blijk would be the link between Greenwood, Schouman, and D. Wolff. He shows himself in so far connected with Greenwood and Schouman, that his way of stippling is sometimes pretty thick; also he uses in some pieces the stippled background. Line-engraving and stippling are combined in his work. Some of his glasses represent the drinkers and smokers of the mezzotints, as known in the work of Greenwood, Schouman, and Hoolaart; such is the glass in Mr. Buckley's collection (No. 72), either dated 1756 or 1786, which belongs to the best of his work. Of the same kind is a large bowl in the Rijks Museum, with two smokers, dated 1776; then a glass, with a peasant and his wife, in the Steen at Antwerp, without date; and the Venus and Cupid of 1776 (Rijks Museum, Amsterdam) is also similar to the work of Schouman. Besides these there are some other glasses with his name which show great affinity to the kind known as Wolff's speciality: little children on clouds forming allegorical groups. Such are two glasses in the Museum of Arts and Crafts in Prague: one, on Liberty, dated 1775; and one, on the Art of Painting, of 1777. In the Rijks Museum, Amsterdam, there are two such glasses, of which the one, on Friendship, is signed; the other, on Joy, may with certainty be ascribed to Blijk. In Rotterdam (Museum Boymans) there is a signed plate of glass with an allegory on Poetry. These scenes are not framed and have no background. They are merely stippled; they show some line-engraving, only where hair is reproduced. Quite different as a subject is the whale-fishing on a glass in the Rijks Museum. It is entirely stippled, even the tackle of the ship, and in a thin, fine way. A glass with an allegory and a poem, made for the French Church of Dordrecht, dated 1777 (Museum Oud-Dordrecht), gives evidence that Van den Blijk lived in this town.

Interesting from its date is an unsigned glass with amorettos in clouds, of 1762, made for the wedding of Paulus Gevers and Jacoba Maria Cornets de Groot, in the Coll. Mühsam, Berlin. It is stippled and has some line-engraving.

A more important master than J. van den Blijk must have been *W. Sautijn*, but we have not more than two glasses with his signature. One of these, curiously enough, is wheel-engraved; the other is stippled with the diamond. Both pieces are done with great skill. Sautijn is a patrician name of Leiden. The wheel-engraved piece (Museum Lakenhal, Leiden) is dedicated to the circle of friends of the court of sheriffs in Leiden, which was founded in 1755. The stippled glass (Rijks Museum, Amsterdam) bears the coat of arms of the Admiralty of Amsterdam, surrounded by naked children and symbols of the sea. It has been drawn fluently and lightly, carefully and regularly, chiefly with dots, with only some strokes in the hair and in the outlines. It belongs to the most eminent of its kind. The subject is related to the engravings of Jan Punt (1711–1799), a pupil of Jacob de Wit. I should not wonder if Punt were the originator of several subjects of this kind that we see on stippled glasses.

It is difficult to say whether Sautijn was a leader or a follower, but his stippled glass belongs to the kind which generally is called Wolff glass.

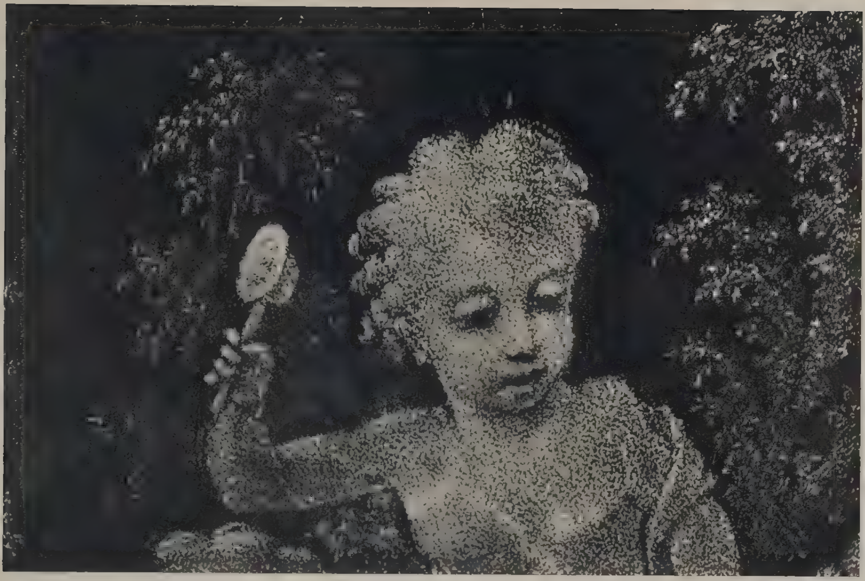
We do not know much about *D. Wolff* himself. He was born in Utrecht, but worked in The Hague in the workshop of a coach-painter. He was married in 1787 and died before 1808, in which year his name occurs in an auction catalogue as the " famous late Wolff." He is said to have died young. Somebody who had known him said in 1853 that he had often seen him making his little figures on glass with an etching needle and a little hammer. Six glasses, I know, are signed and dated. They all belong to the smaller kind of goblet used in the later years of the 18th century, with oval cups and mostly facet-cut stems, which at this time were all imported from England. They bear the following dates: 1784, a portrait of William V of Orange (Museum Boymans, Rotterdam); 1787, a similar portrait (Rijks Museum, Amsterdam); 1794, an allegory on Sculpture (Rijks Museum, Amsterdam); 1794, the same subject (Coll. Mühsam, Berlin); 1795, an allegory on Liberty (Coll. Mühsam, Berlin); 1796, a portrait of William V of Orange (Rijks Museum, Amsterdam). As the allegories on Sculpture have as a centre a bust of William V, all these glasses but one celebrate the Orange Prince, which would make us think that, in the civil war between Orangists and Republicans, the artist had sided with the first. It seems strange, therefore, that in the year when the Republicans triumphed he should sign a glass with a hymn on Liberty, and stranger still that a year later he again counterfeits the banished Prince.

On analogy with these signed glasses a number of others may be ascribed to Wolff. Their decoration is restricted to a certain kind, but within these limits there is great variety. There are portraits of the Prince and Princess of Orange (Coll. Wilfred Buckley, No. 77A); of Hendrik Hooft, burgomaster of Amsterdam (dated 1787); of Jacob van Nuys Klinkenberg, professor at Amsterdam; of Cornelis de Gijzelaar, pensionary of Dordrecht; of Van Berckel, pensionary of Amsterdam; of Oldenbarnevelt. There are coats of arms of the Oranges and others, surrounded by amorettos. Children, naked or clothed, on clouds or in a garden, are his favourite subject. Most of these glasses bear a title, such as: Peace, Liberty, Friendship, or Harmony. Some show grown-up people, but in the same surroundings as the children, and always with some symbolical meaning. There are glasses of this kind in many collections (Amsterdam, Rotterdam, Gouda, Dordrecht, The Hague, Brussels, London, Wilfred Buckley, Berlin, Prague, Reichenberg).

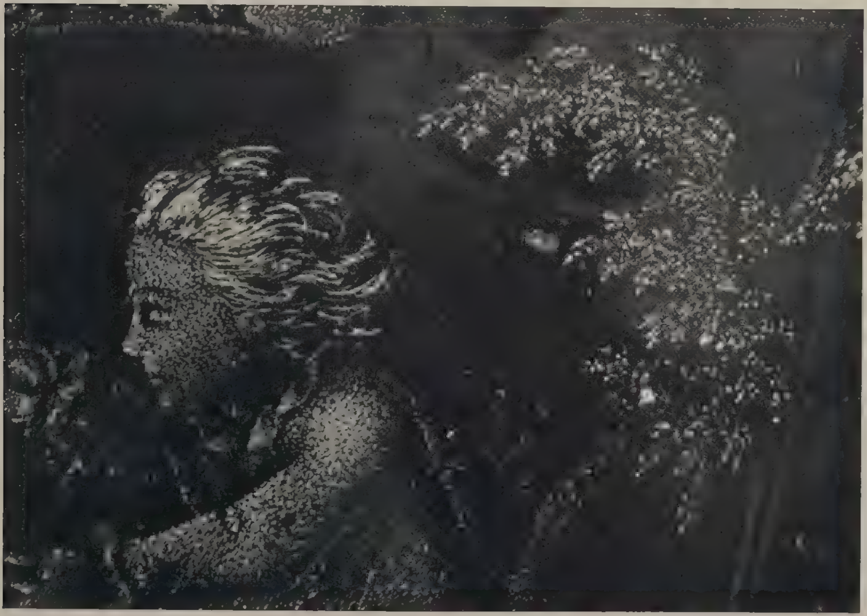
Still, the number of these glasses is not so large as generally is thought. The glasses with D. Wolff's signature have all been stippled in a particular way. The figures have no strong light and dark parts; they are equally filled with thin dots all over, and everything is done in stippling, without a single scratched line (Fig. H). Now there is a second group of glasses, not less numerous, with closely related scenes, but there is a difference in the way of stippling. Deviating from the others, they show a great contrast between lights and shadows, and consequently the figures are more transparent and lighter. The hair of nearly all these figures is engraved in lines (Fig. J). (There are examples of this kind in Amsterdam, The Hague, Rotterdam, London, Berlin, Reichenberg, and Prague.) Amongst these glasses are several with republican devices, and I know only one with a coat of arms of the Oranges. This would justify giving them a date in the last decade of the 18th century; but one of these glasses, and a very characteristic one (Fig. J), has a dedication (also written in the stippling way) which, translated, reads: "Presented to the society of the VVVVV on the 10th of February 1770 by Joh. Colla." As it seems impossible that Wolff worked in two quite different ways at the same time, we either must believe that the more subtile and more beautiful way belongs to his first period, or we have to distinguish the work of two different artists. In the first case we have to believe that he profited by the civil discord and worked for both parties, which already might be concluded from his signed work. In the above named catalogue of the auction of the Coll. Van Buren in 1808 the fourteen glasses under the name of Wolff are recommended as being of *his best period*. From the description I can trace amongst these, four glasses of one kind and three of the other. Moreover, a glass of the light-and-shadow kind (Rijksmuseum), with a galloping horse and the words "Aurea Libertas," has the engraved inscription (translated): "As we see the horse hovering on the glass, as if it were alive, stippled by Wolff, so must live amongst us without trouble and pain the golden Liberty." Although he probably did not write it himself, this inscription certainly dates shortly after Wolff's time, and it seems strange that another man's work was taken for his so soon.

There is another difficulty still: a glass with an allegory of Trade with Mercury and a view of the sea (Rijks Museum, Amsterdam), which in style is quite similar to Wolff's signed pieces, has underneath the foot the signature *J. G. Smeyser*. There are other glasses with stippled landscapes (Amsterdam, The Hague, Berlin). Shall we ascribe them to Smeyser? I must leave these questions still unresolved.

Somewhat more different in style is a group of glasses with the Arms of the House of Orange and of the Netherlands (Rijks Museum, Amsterdam;



H (magnified 12 times). Dated 1794.



J (magnified 12 times). Dated 1770.

Boymans Museum, Rotterdam; Sypesteyn Castle, Loosdrecht; Museum Lakenhal, Leiden; Museum of Arts and Crafts, Prague; Kunstgewerbe Museum, Cologne; Kunstgewerbe Museum, Reichenberg), very lightly stippled, with a strong contrast between light and shadow, so that the grim lions, the holders of the Arms, seem to jump forth from the dark. The engraving on most of these glasses has a reddish tinge. This is also the case with a glass, dating from the same period, with the bust of a peasant counting money, in splendid, thin stippling, after a mezzotint by Abraham Blooteling (Rijks Museum, Amsterdam).

Other heraldic glasses are different again in style, and I should not wonder if there have been many more Wolff-like masters than we generally presume.

We know of one and he excels all others in very light and transparent stippling. His name is *L. Adams*. Five glasses in different collections bear his name, one of these is dated; two more can be ascribed to him with certainty. His signed glasses are in the Museum Boymans, Rotterdam, the British Museum, the Rijks Museum, Amsterdam, the Coll. Pazaurek, Stuttgart, and the Coll. Mühsam, Berlin. The glass in Rotterdam is dated 1806. It shows in stippling an amoretto with a garland of roses with the monogram A V R and on the other side some engraved verses. It is signed Adams Fecit. Another glass in the same collection bears in stippling an allegory on the grain trade, one of the bags with grain is marked A D, certainly an allusion to the name of the maker, because, although it is not signed otherwise, it is certainly by his hand, as well as a third glass in this collection with an allegory on Trade and Shipping.

P. Luyten signed in 1799 a pretty poor piece in the Rijks Museum, Amsterdam.

Pieter Kibon of Haarlem and Andries Melort of Dordrecht continued the art of engraving and stippling in the 19th century.

Pieter Kibon was a glass merchant of Haarlem, who lived from 1736 to 1826. Some of the glasses on which he engraved inscriptions and decorations of flowers and laurels he signed with his name or initials. Especially curious are those which he made at the great age of from 80 to 84 years (Frans Hals Museum, Haarlem).

Andries Melort of Dordrecht (1779–1849) engraved window-panes with elaborate copies after Isaac van Ostade and Paul Potter; he also did some very fine stippling. Dated pieces of 1834, 1839, and 1840 are in Amsterdam (Rijks Museum), and one of 1840 in Berlin (Coll. H. Stibbe). His son, *S. J. Melort*, was a less skilful dilettante.

The last Dutch engraver of renown was the Amsterdam chemist, *D. Henriques de Castro* (died 1863); he was a great amateur of engraved glasses and added many pieces by his own hand to his collection. He was experienced in all methods—engraving, stippling, and etching—and not seldom we find all these methods applied in a single piece. In the large chalices of 1862, with the English inscription, "Engraved with diamond by Daniel Henriques de Castro," the working of the etching water is easily to be distinguished underneath the stippling and engraving (Fig. L). Exactly how he worked we do not know, but in this connection Mr. W. H. Köhler made an interesting find (published in *Oude Kunst*, 1918, p. 315) in a stippled glass with an old man's face, which he compared with Schouman, but which most probably is De Castro's work. Together with the glass, Mr. Köhler got hold of a print that was used as the model, and in which triangles had been cut out, so as to fit it in the glass. It is not quite impossible that the half-finished 18th-century glass (Fig. G) was worked in the same way; but still it must be difficult to follow exactly the lines through the thickness of the glass. However this may be, most 18th-century glasses give the impression of a more liberal phantasy, although with all its charm we cannot consider diamond engraving an independent art, and we must take it for what it was meant to be: delightful dilettantism.

LITERATURE ON DIAMOND ENGRAVING

D. Hendriques de Castro, Dz. *Een en ander over glasgravure. Oud-Holland*, 1883, p. 274 ff.

A. Hartshorne, *Old English Glasses*. London, 1897.

A. M. Pareau, *Nederlandsche Glasgraveurs en Glasetsers en hun werk. Jaarverslag Koninklijk Oudheidkundig Genootschap*. Amsterdam, 1900.

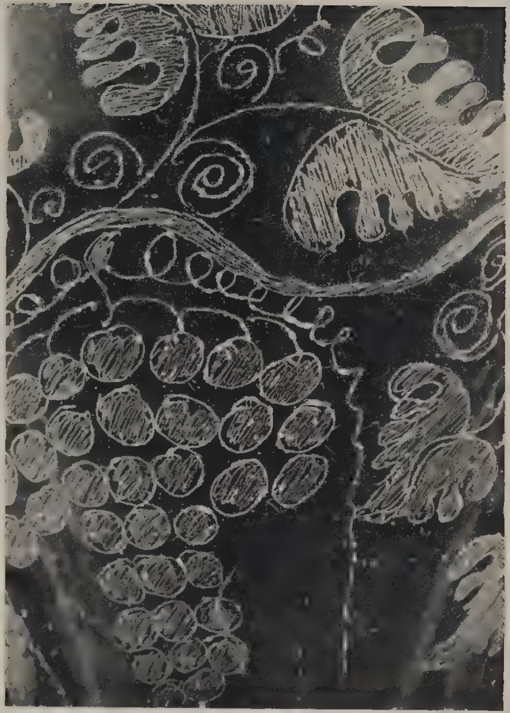
R. Schmidt, *Die gerissenen und punktierten holländischen Gläser. Cicerone*, 1911, p. 817 ff.

R. Schmidt, *Das Glas*. Berlin (2nd edition), 1922.

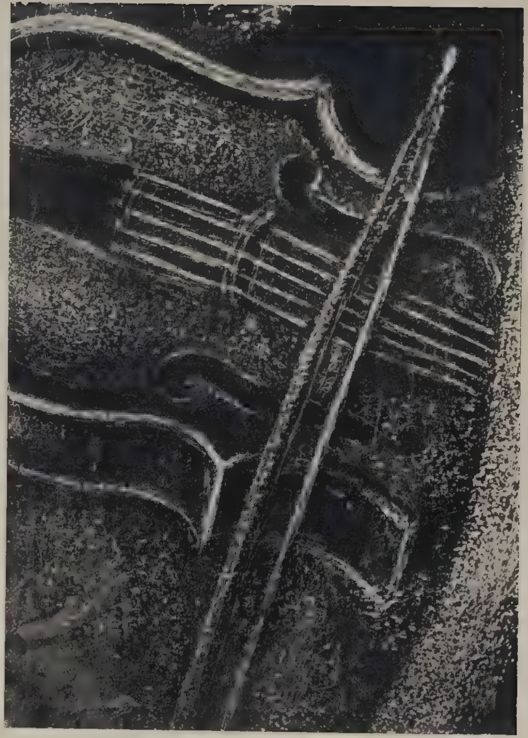
R. Schmidt, *Die Gläser der Sammlung Mühsam*. Berlin, 1914.

H. E. van Gelder, *Christoffel Jansz. Meier. Oud-Holland*, 1917, p. 118 ff.

F. Hudig, *Graveerwerk van Anna Roemers Visscher. Oud-Holland*, 1923–4, p. 175 ff.



K (magnified 5 times). *Circa* 1665.



L (magnified 6 times). Dated 1862.

"Beauty is truth, truth beauty,—that is all ye know on earth,
and all ye need to know."

Keats.

ACKNOWLEDGMENTS

Much of the information in this book has been drawn from the following authoritative works :—

Francis Buckley : *Old English Glass*, 1925.
Achille Deville : *Histoire de l'Art de la Verrerie*, 1873.
Edward Dillon : *Glass*, 1907.
Edouard Garnier : *Histoire de la Verrerie*, 1886.
Albert Hartshorne : *Old English Glass*, 1897.
Ferrand W. Hudig : *Das Glas*, 1923.
Frederick William Hunter : *Stiegel Glass*.
M. Jules Labarte : *Arts of the Middle Ages and Renaissance*, 1855.
Alexander Nesbitt : *Catalogue of Glass, Slade Collection*, 1871 ; *Catalogue of Glass Vessels in the South Kensington Museum*, 1878.
Robert Schmidt : *Das Glas*, 1912 and 1921.

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WILFRED BUCKLEY.

September 17th, 1926.

CHAPTER ONE

OUTLINE OF THE HISTORY OF GLASS MAKING

Edward Dillon selects the following excerpts from a list of properties enumerated by Christopher Merret, the earliest English writer on glass (*Art of Glass*, 1662), " by which we may easily differentiate it from all other bodies." " 'Tis a concrete of salt and sand or stones. 'Tis artificial. It melts in a strong fire. When melted 'tis tenacious and sticks together. . . . When melted it cleaves to iron, etc. 'Tis ductile whilst red hot, and fashionable into any form, but not malleable, and it may be blown into a hollowness."

Modern students generally agree that it is probable that glass was made first in Egypt, but the approximate date is shrouded in mystery. Ancient writers give various accounts of the first discovery that led to the art of glass making. Pliny (A.D. 23–79) tells us that Phœnician merchants returning to Syria from Egypt with a cargo of natron or soda landed on the sandy beach beneath Mount Carmel, near the mouth of the river Belus, and when cooking rested their pots on blocks of natron unloaded from their ship, and that in consequence of the heat of the fire the alkali and sand were fused, thus making glass. Strabo (*circa* 63 B.C.–A.D. 21), writing almost a century before Pliny, refers to the river Belus and says that its vitreous sand was transported to Sidon, there to be fused in the making of glass. Tacitus (*circa* A.D. 53–117) makes a similar reference. Josephus (A.D. 37–95) gives another version of the first accidental discovery of glass. He records a story of a wood being set on fire by Israelites who noticed that the nitre became fused with sand, and in consequence they sought to make artificially the substance that had resulted from accident. Achille Deville (*Histoire de l'art de la Verrerie dans l'antiquité*, Paris, 1873) asserts that the art of fusing and of blowing glass was practised by the Egyptians in the " earliest times." He cites, as evidence, sculptures in the caves of Beni-Hassan-el-Gadim which are said to have been executed during the Eighteenth Dynasty, more than three thousand years ago, which appear to depict the act of blowing glass. Hartshorne (*Old English Glasses*, London and New York, 1897) does not agree that these sculptures represent glass blowers, but adds his opinion that " . . . it would, in all probability, be to the artistic period of the Fourth Dynasty (3998–3720 B.C.) that the introduction of glass making may be ascribed." Dillon (*Glass*, London, 1907) expresses the view that " We now have almost full assurance that glass in a true sense was practically unknown to the Egyptians before the time of the Eighteenth Dynasty (say between 1600 and 1500 B.C.), and that for at least a thousand years after that period all that was made was produced by a primitive process in which the blowing iron found no part."

Differentiation should be made between glass as such and molten material used for glazes that may have been made into slabs, cut up and used as inlays before glass vessels were made.

Discoveries by Sir Flinders Petrie in the winter of 1891–92 prove that the manufacture of glass was carried on in the new town established by Akhenaten at Tell-el-Amarna *circa* 1450–1400 B.C. According to him, glasses were fashioned at this time in the following way:—

" A metal rod of the size of the intended interior of the neck, and rather conical, was coated at the end with a ball of sand held together by cloth and string. This was covered with glass, probably by winding a thread of glass round it, as large beads of this age are thus made. The vase could then be reheated as often as needed by holding it in a furnace, the metal rod forming a handle, and the sand inside the vase preventing its collapse. Threads of coloured glass could then be wound round it and incorporated by rolling: the wavy pattern was produced by dragging the surface in different directions, the foot was pressed into shape by pincers, the brim was formed and the handles were put on. Lastly, on cooling, the metal rod would contract and come loose from the neck, and after it was withdrawn the sand could be rubbed out from the body of the vase." (No. 1D).

It appears that in early days glass was made by the same process in Phœnicia as in Egypt. Coloured beads, probably the earliest products of Phœnician glass makers, have been found in India and in other parts of Asia and of Europe, along the recognized trade routes. (Nos. 1A, 1B, and 1C.) The earliest Egyptian dated example appears to be a vase of transparent greenish glass found in the north-west palace of Ninevah, on one side of which are engraved a lion and a line of cuneiform characters, in which is the name of Sargon, King of Assyria, 722 B.C. In Alexander Nesbitt's opinion (*Notes on the History of Glass Making*, 1871), " Many of the beautiful little vases found in tombs in the countries whose coasts are washed by the Mediterranean, and which are generally called Greek, are, there is good reason to think, the products of Phœnician industry," although at a remote period glass vessels were made also in Sicily, in the islands of the Archipelago, and in Etruria.

The discovery of the art of blowing glass had a very great influence on the use of glass. Probably this method was first practised on the Phœnician coast, perhaps at Sidon, not long after the death of Alexander (323 B.C.) (Dillon: *Glass*, p. 59). There is reason to believe that when the use of the blowing pipe was first introduced it was applied as a supplement to a moulding process, the glass being blown into a mould, and the irregularities on the vessel thus produced being removed by grinding on a wheel. Dillon gives the following brief account of the method of blowing glass as practised by the Romans: he points out that the implements used were very simple and that such tools have been used with little alteration until modern times:—

"The molten glass is collected on the extremity of the blowing iron to form a 'gathering.' This 'gathering,' while still in a soft condition, is rolled upon the 'marver' into a cylindrical mass. By blowing down the tube this mass is now distended to form a hollow pear-shaped vesicle, for which it will be convenient to adopt the French term 'paraison.' It is from this paraison that a start is made to form by a 'spinning' or 'flashing' process a sheet of broad or crown glass: again the vesicle may be made to assume a cylindrical shape, and then opened out to form larger sheets of glass: or finally—and this is for us the most important—by holding the blowing iron to which the bulb of glass is attached in a vertical position (or sometimes by swinging it over the workman's head), and then by shaping it by means of certain simple tools, the paraison is started on the course by which it will finally be converted into a bottle or into a bowl-shaped vessel. I will here only dwell on one point. It is evident that so long as the glass is attached to the blowing iron, although a simple bulb-shaped vessel may be formed, there is so far no means of shaping or finishing the upper portion. Before this can be done the further extremity of the paraison must be attached by means of a small gathering of molten glass to a light tapering rod of iron, the 'punto' or 'pontil.' The vessel—for so the paraison may now be called—is at this stage removed from the blowing iron. This is done by 'wetting it off' by means of a rod of moistened iron. The glass vessel, now attached by its base to the 'pontil,' is reheated, and the further treatment taken in hand by a workman seated on a stool with long projecting arms, on which (or on the knee of the workman) the pontil is rotated. The shaping is chiefly done by an iron instrument called the 'procello' or spring-tool, formed like a pair of sugar tongs by two blades connected by an elastic bow. Finally, the edges are finished off by shears and scissors of various forms, which cut the hot glass as if it were a piece of soft leather. The now finished vessel is removed from the pontil by wetting the point of attachment, and is taken to the annealing oven."

The glass makers of the Roman Empire were inspired by the earlier products of Egypt and of Phœnicia. During this period glass was made or used for more purposes than at any time, before or since, although its employment for optical instruments was only in a rudimentary stage, and its use for windows, which continued throughout the Dark and Middle Ages, was only gradually extending itself when Roman civilisation was overwhelmed by the Hunnish barbarism. The quantity of glass that was in common use at that time is indicated by the fact that in the time of Martial (*ob.* A.D. 103) the poor (Jews ?) who inhabited the quarter of Rome beyond the Tiber made a living by hawking sulphur matches and exchanging them for broken glass.

The principal varieties of Roman glass may be placed chronologically, according to Dillon, following roughly the order in which the various methods of working and styles of decoration were dominant, in successive ages, under the following headings—the inlaid and millefiori first (a method first practised in Egypt), after these the moulded, then the blown, and finally, the cut and engraved. The finest example of Roman glass, or perhaps of glass of any period, is the Portland Vase found in 1644 in a mound called Monte del Grano, three miles from Rome, in a tomb supposed to be that of the Emperor Alexander Severus (killed in A.D. 235). The vase is probably of earlier date. It measures 10 inches high and 6 inches in diameter. It was made by superimposing paste of one colour over paste of another and then carving the design, mainly by the lapidary's wheel, the work being finished by the use of a diamond or other means. Josiah Wedgwood, in commenting on this glass in 1786, wrote that, supposing at the time of writing one or two artists could be found equal to the task of duplicating the work in all its delicacy, and if such artists could be persuaded to quit a lucrative branch of their profession and to devote to it half a lifetime, £5000 would not be equal in amount to their gains from the work in which they were then employed.

Space does not permit the enumeration of the various methods employed by the Romans to decorate their glass, such as the making of intaglios as early as in the 4th century B.C., of cameos two centuries later, of pictorial representations made by the use of gold leaf embedded in or applied to the surface of the glass in the 1st century, or the use of bands or threads of white or coloured glass, plaited bands or others resembling vitro di trina. Engraved glass did not meet with the approval of the early Christian fathers. Clement of Alexandria protested in the 3rd century that "the pretentious and useless vain glory of the engravers on vessels of glass may well cause them to tremble, and such work should be exterminated by our good institutions."

The ordinary glass that we know as Roman was made during a period of about four hundred years. It was manufactured at one time or another in nearly every country into which the Romans penetrated, from Syria and Mesopotamia on the one hand, to Spain and Britain on the other.

During the best period of Grecian art glass was used for architectural purposes. Seneca contrasts the vaults of the bath chambers of his own day which were covered with glass with the rude simplicity which marked the times of the Scipios. He also tells us that a ball of glass filled with water enlarges minutely written letters. Pliny tells us of the earliest recorded instance of its use in architectural decoration, in the theatre constructed by M. Scaurus during his edileship in the 1st century B.C. This theatre was in three stories—the lowest of marble, the second of glass, and the third of gilt wood, and it was capable of holding 80,000 persons. The glass, no doubt, was not in solid masses, but was attached to the walls in thin plates or "crustæ." Pliny also tells us that on the tomb of Hermias, a prince of the island of Cyprus, was a marble figure of a lion with eyes of emerald which shone so brightly into the sea that they frightened away the tunnies from the adjacent fisheries, so that it became necessary to change the eyes.

As Rome declined artificers emigrated to Byzantium, and whether or not glass making was practised there in the time of Constantine, there is no doubt that it was subsequently. Nothing very definite is known of the products of Byzantium workshops, but it is not improbable that a few glasses that still exist were made there between 800 and 1200 A.D. These examples include the wonderful series in the Treasury of St. Mark's in Venice, which it is believed was taken in 1204 by the Venetians when Constantinople was captured. Another example (attributed by Schmidt to Egypt or Syria) is the famous Sacro Catino, now in the cathedral of St. Lorenzo at Genoa, which fell to the share of a Genoese when the Crusaders sacked the town of Cæsarea in 1101. This cup was long supposed to be an emerald. During the Revolutionary wars it was taken to Paris, and subsequently returned to Genoa, broken. It is asserted that it is the Holy Grail that was used at the Last Supper. According to tradition, Joseph of Arimathea, having obtained permission from Pilate to take down the body of Christ from the Cross, proceeded first to the upper room where the Last Supper was held and found there the dish that had held the Paschal Lamb: then, as he took down the Lord's dead body, he received into the vessel many drops of blood which issued from the still open wounds in His feet, hands, and side.

The advance of Christianity put an end to the practice of burying articles, such as glass, with the dead, and in consequence no information is to be obtained, in regard to glass, from the tombs of those who were buried after Pagan times; hence there is an almost complete gap in our knowledge of the glasses that were made from the time of the fall of the Roman Empire until the 13th century. In the West, during the intervening period, the manufacture of glass was carried on almost entirely in the woods, where fuel was easily obtainable; little was produced of artistic interest, and few examples of this forest or green glass made during the Middle Ages have survived. Seven glasses, known as "Hedwig glasses," exist which show Eastern influence, but which may have been made in Germany towards the latter part of this period. Of the glass made in that part of the East ruled from Constantinople or influenced by Byzantine civilization we know little except what we can learn from the mosaics existing in contemporary churches and the few existing vessels previously referred to. As to the manufacture of glass made in that part of the East which was not included in the Byzantine Empire, or which fell early under the dominion of the successors of Mahomet, our information is also scanty, although a remarkable illustration of Persian work exists in the cup formerly known as the "Cup of Solomon" preserved in the Bibliothèque Nationale in Paris. It is a shallow golden bowl having a central medallion of rock crystal sculptured with the effigy of the King Khosroes II, one of the last Sassanian monarchs (A.D. 590–628), and rosettes and lozenges of white, emerald green, and purple glass. Glass was made in various countries under Arab rule, as is proved by our knowledge of coins, weights, or tokens of glass that are usually inscribed with the name of Fatemite Caliphs of Egypt—an example exists in the Bibliothèque Nationale bearing the name of Al-Mo'izz, who reigned in Egypt from A.D. 952 to A.D. 975. That glass was well known in the East, even in Arabia in the 7th century, is shown by a reference in the Koran (Sura XXVII) to the legend that Solomon deceived the Queen of Sheba by paving part of his hall with glass, so that when she visited him she might raise her skirts, thinking the glass to be water, and so enable Solomon to see her ankles.

Other references are to be found showing that glass was made throughout the East during succeeding centuries until we reach the 13th, 14th, and 15th centuries. At this period we find many existing examples of enamelled lanterns and other vessels made in the Saracenic East that represent what Dillon describes as the most magnificent and decorative glass made in the whole of history. Uncertainty exists as to whether some of these productions were made in Egypt, but there is no doubt that many were made in Mesopotamia as early as the 13th century, and in Syria during the 13th, 14th, and 15th centuries. The enamelled glasses of this period are of particular interest from a technical standpoint, as the application of solid or translucent enamels to the surface was a new departure and, so far as we know, preceded the application of any material of the kind to porcelain or to faience, although the Romans and the Byzantine Greeks had made use of washes of opaque paints. Dillon is of the opinion that the most important centre for their production was Damascus, for the period of decline set in after the taking of that city in 1400 by Timur, who ruthlessly transported to his capital (Samarkand) many skilled Syrian artists, amongst whom were glass makers. In Egypt the decline did not come so soon; it was postponed until perhaps the 16th century, when after a period of turmoil Egypt fell under Turkish rule and the short-lived period of enamelling came to an end. During the period when Saracenic art was at its best the glass makers in the West were bending their energies to the production of the fine stained glass that is to be found in their churches.

We now come to the period when the art of Venetian glass makers was in the ascendant, a movement stimulated by knowledge gained when Constantinople was sacked in 1204, which was destined to influence glass makers throughout Western Europe. The history of modern glass begins with the Venetian "cristallo" of the 16th century. Glass had been made in Venice and Murano as early as the 11th century. In 1279 the glass workers formed a guild. In the 14th century we know that the water power of the Alpine streams was used, as at Cortina d'Ampezzo in the Italian Tyrol, for grinding and polishing glass. Enamelling was done *circa* 1300. The Aldrevandini cup now in the British Museum is an example of such work; but with the exception of this and possibly one or more other pieces, we know of no others that can be definitely claimed to have been made before the 15th century. Hartshorne tells us that, according to a Venetian chronicle, crystal glass was invented in 1463 by the Berovieros in Venice. A distinction was then made between

" cristallo " and the ordinary glass, termed " comuni." During the 16th century the finest examples were produced of the glass described by Dillon as " those graceful vessels of endless variety of form, thin and diaphanous, in which the skill of the glass blower attained its most complete expression." After the end of the 16th century the art entered into a period of gradual decline, but before that decline had set in the influence of the Venetians had extended throughout Europe. This influence was spread directly and indirectly. Directly by workers from Murano who found their way to the various courts of Europe, where they were encouraged by the reigning Princes to set up glass houses for the making of glass " façon de Venise," and indirectly through the Altarists. The Altarists were workers at L'Altare, a little Ligurian town a few miles to the north of Savona, where, according to tradition, a body of emigrants from Normandy had set up glass houses in the 11th century. Later, probably in the 14th century, Muranese workmen came to L'Altare bringing with them their ideas and traditions. By the end of the 15th century the Altarists, like many of the Venetians, had introduced their art into other European countries.

The Venetian authorities had done their utmost to restrict their knowledge of glass making to their own territory. As early as 1275 the Great Council had forbidden the exportation of sand and other substances used for making glass. In 1547 the Council adopted further measures, inasmuch as they applied to glass workers a statute, enacted by the Inquisition of State in 1454, which specified that if a workman of any kind should transport his craft into a foreign country to the injury of the Republic, and refuse to return, the persons most nearly related to him should be imprisoned and an emissary should be commissioned to put him to death, a punishment which appears to have been inflicted in certain instances. During the period of the pre-eminence of Venetian glass making many varieties were made. Sir Wollaston Franks makes the following classification: (1) Vessels of colourless or transparent glass. (2) Gilt and enamelled glass. (3) Crackled glass. (4) Variegated or marbled opaque glass, commonly known by the German word " schmelz." (5) Millefiori or mosaic glass. (6) Reticulated, filigree or lace glass, called by the Italians " vitro di trina," " di filigrana," " a ritorte," and " a reticelli."

During the 17th and 18th centuries the art of decoration was developed further in Germany and in the Netherlands, particular attention being given to painting, enamelling, and engraving with the wheel and with the diamond, the latter method, engraving with the diamond, apparently having originated in Venice during the third quarter of the 16th century. In the Low Countries this art reached its perfection.

From the 17th century onwards the influence of the art of glass making of one country upon that of another brings about an involved situation. Venetians and Altarists, as has been said, were scattered throughout Europe. Bohemian methods were imported into Venice, into England, and elsewhere. Glass houses in France and the Netherlands imported Venetian, German, and British workmen, etc., etc. George Ravenscroft, in conjunction with De Costa, an Italian with knowledge of the making of Venetian crystal glass, first acquired, according to Francis Buckley, in 1677 the art of making the typical British flint glass or "glass of lead," and thus initiated another movement that revolutionized the making of glass throughout Europe. Thus it follows that it is even more difficult, in many cases, to differentiate between glasses made in various countries after the end of the 17th century than between glasses made prior to that time. It may be said generally that from the end of the 17th century onwards the art of glass making became to a large extent cosmopolitan. The situation in the United States, though on a smaller scale, is similar to that in the continent of Europe during the 18th century, for, although no fine glass was made there, such as there was in many instances was made by workmen who, coming from various European countries, naturally brought with them the traditions of form and of method employed in the countries whence they came. Frequently, in the absence of definite data, it is impossible to distinguish between glasses made in the United States and glasses made in England, Holland, or Germany during the same period.

In looking back through the three thousand years during which we have knowledge of the art of glass making, the periods and movements that stand out above all others as the most important are those of (1) primitive glass in Egypt from 1500 B.C.; (2) the first centuries of the Roman Empire; (3) the Saracenic enamelled glass of the 13th and 14th centuries; (4) Venetian glass of the Renaissance; (5) German and Netherlandish glass of the 17th and 18th centuries; (6) British glass after the making of the "glass of lead," at the end of the 17th century.

CHAPTER TWO

DECORATION

Apart from the actual fashion of the glass or decoration by moulding, the following are the chief methods that have been employed to decorate glass :—

(1) *The use of glass of various colours.*
    (*a*) In the making of the design.
    (*b*) In imitation of stones, as in mosaic or millefiori glass.
    (*c*) In threaded or filament glass.

(2) *Sculpture.*

(3) *The use of gold foil.*

(4) *Engraving.*
    (*a*) With the wheel.
    (*b*) With the diamond point.
    (*c*) With fluoric acid.

(5) *Surface irregularity.*

(6) *Colouring.*
    (*a*) With enamel.
    (*b*) With paint that is not fired.
    (*c*) With paint that is fired.

(1) THE USE OF GLASS OF VARIOUS COLOURS.

(*a*) *In the making of the design.* The means employed by the earliest Egyptian and Phœnician glass makers to " drag " have been described in the brief historical outline. By these means a wavy pattern was obtained, each wave being an actual strip of glass contorted.

(*b*) *In imitation of stones.* Dillon gives the following description of millefiori glass as made by the early Romans, which he describes as a development of the fused mosaics of the early Egyptians :—

" In the millefiori bowls of Greco-Roman times we can distinguish two predominant types : the madrepore design in the first place, which closely imitates the pattern on a polished slab of coralline limestone, with the addition that the ground is of a deep translucent green or of a purple of subdued tone. In this class may be placed such exceptional pieces as the bowl from Crete, in the British Museum ; here we have rosettes of yellow, green, and red upon an opaque ground of a rich blue. The second type is equally characteristic, but more difficult to describe. Short, loosely rolled scrolls of an opaque white float in a more or less transparent base, interspersed with a few quadrangular masses of gilt glass. It would be difficult to say what natural substance is imitated in this case—perhaps some kind of fossiliferous *lumachella* marble, which may have been in vogue at one time at Alexandria. We may be quite sure that the Roman glass-workers would not have failed to imitate the famous Murrhine vases, which seem to have been originally carved from a natural stone; and it is among the millefiori glasses that such imitations may probably be looked for.

" These millefiori bowls are evidently built up with more or less spirally arranged fragments of glass mosaic,[1] the individual pieces having been probably cut from a cane of glass, itself formed by a combination of minute rods, as in the case of the Egyptian ' fused mosaics.' These pieces were arranged in the mould in a coil, starting from the centre, but how far, if at all, during the subsequent partial fusion, they were subjected to any blowing operation is a moot point. In any case, the final effect is the result of an elaborate process of cutting on the wheel and subsequent polishing.

" In this millefiori glass the sections of the canes are arranged with a studied irregularity (so as, in a measure, to mask the spiral arrangement), and a further variety is given by setting up many of them obliquely to the surface. On the other hand, we can seldom, perhaps never, find any trace of the distortion, which would inevitably be caused by the subsequent use of the blowing-tube. In other cases, the individual fragments may be built up of irregular longitudinal bands, so as to give the general effect of an agate breccia, as in a fine bowl at South Kensington. When the contorted bands are continuous we have another important type, founded apparently upon the endless varieties of banded agate and other native stones that have been formed by slow deposition in the hollows of rocks. One variety imitates amethystine quartz, but here, as elsewhere, rich combinations of colour, which can have no prototype among natural stones, are often introduced. We have an exceptionally beautiful example of this in certain cigar-shaped alabastra, said to have come from Sidon."

The Venetians in the 14th century made an opaque red glass resembling jaspar, and in 1443 a Milanese manuscript gave a formula for making

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[1] This arrangement in spiral coils is very characteristic of the glass of this period, though it is generally only to be seen on close examination. We have noticed it in the case of the " lace-glass " from Canosa. It may give us some clue as to the method of manufacture.

"Schmeltz" by means of a mixture of certain salts of silver, iron, and copper. Dillon says that "the Schmeltz *par excellence* of the Venetians (the German name would seem to point to a northern origin) is an irregularly veined and mottled mass, a somewhat unpleasant combination of bluish green and purple tints, calling to mind certain kinds of slag—indeed it may have originally been made in imitation of some such substance." (Plate 13A).

Mention must also be made of "splashed" glass, where enamel of various colours has been scattered over the "paraison" at such an early stage that the splashes have had to follow the changes of form acquired by the vessel in the course of its modelling. This means of decoration resembles similar work done by the Romans, if not by the Egyptians.

(c) *Threaded or filament glass.* This was made first by the early Romans. At the end of the 15th century or early in the 16th (but positively before 1540, for in that year it was mentioned by Biringuccio) this means of decoration was revived, or rather rediscovered, by the Venetians, for it is believed that the art was not handed down from Roman times, but that through the study of Roman remains, in which much interest was taken at the time of the Renaissance, the method of making filament glass was rediscovered and perfected. Mathesius records in 1562 the making of this type of glass in Germany. Labarte, in his *Handbook of the Arts of the Middle Ages and Renaissance* (London, 1855), gives this description of the methods used, which he obtained from M. Bontemps, the Director of the Choisy Glass Works:—

"The vases with coloured threads and filagree ornamentations are composed of the assemblage of a certain number of small glass canes[1] of cylindrical form, $\frac{1}{8}$ to $\frac{1}{4}$ of an inch in diameter, made either of opaque white glass,[2] of coloured glass, or of glass enclosing filagree patterns.

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[1] These little rods were called *canne* by the glass makers of Murano, and those enclosing filagrees, *canne-ritorte*. "Cane" invariably means a solid stick of glass; "tube," a hollow one.

[2] The name of white enamel is commonly given, even now, at Venice, to the threads and filagrees of an opaque, or milk white, which decorate the Venetian glasses; we shall not adopt this denomination, though enamel is in truth but a coloured glass. We reserve the term enamel; 1st, to vitreous compositions either dead white or variously coloured, which are ground and laid on with a pencil upon glass, porcelain, pottery, and metals; 2nd, to the vitreous preparations of various colours which are melted and re-united by juxtaposition in a metal excipient, and which constitute those kinds of mosaics which are designated as encrusted enamels; 3rd, the transparent, vitreous compositions employed in the *pitture a smalto* of the Italians, the translucid enamels upon relief. All these vitreous compounds are fixed upon their excipient by a heat sufficient to melt them partially without affecting the object upon which they are applied. With respect to the dead white or

These canes, prepared beforehand, are disposed in such order as the glass-maker may choose, and are often placed alternately with canes of plain white glass[1]; they are welded together by fusion and blowing, and finally moulded, when they form a compact homogeneous paste (*paraison*[2]), convertible like any piece of ordinary glass into vases of every form. As many as twenty-five or thirty, or even forty canes may enter into the composition of a Venetian vase; it is therefore indispensable, before explaining the processes of their fabrication, to describe the making of these canes of glass, which are, so to speak, the elements of their composition.

" In order to make a cane of coloured glass,[3] the glass blower takes at the end of his blowing iron[4] the requisite quantity of glass from the pot in which it is fused, and rolls it upon the marver, in order to cause the substance to adhere to his blowing-iron, and to make it into a cylindrical mass, of from 2½ to 3 inches long, which he allows partially to cool to give it consistency. He then dips the end of the blowing-iron, charged with the little column of coloured glass, into a melting-pot containing ordinary white glass—in order to surround the coloured glass with a casing of white. He draws the blowing-iron from the pot and again 'marvers' the lump to make the transparent glass of an even thickness round the coloured, and to form of the whole a kind of truncated column of from 2¾ to 3 inches in diameter. This column is then exposed to a

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coloured glasses, used by the glass makers at the heat of a glass furnace, and which enter into the composition of vases during their fabrication, and form one of their constituent parts or elements, these ought to retain the name of glass.

But the opaque, dead white glass did not receive in the 16th century the name of white enamel; it was designated by that of *latticinio*, which may be translated by milk-white. " If it is desired to make enamelled white glass," says Garzoni, " they add chalk of tin (oxide of tin), and it is with this glass, which is called *latticinio*, that are made various ornaments upon glasses of crystal " (*La piazza universale*, discorso lxiv). We purpose retaining this ancient term *latticinio* for threads and filagrees of opaque white glass.

[1] By white is understood colourless and transparent glass.

[2] By *paraison* is understood a mass of glass in the state of paste, adherent to the pipe and already blown; it may be regarded as the first stage in the production of a piece: the technical term in English is " metal."

[3] It is known that by adding certain metallic compounds to glass, at the moment of fabrication, a colouring may be imparted to it, admitting of an infinite variety of tints. The opaque white glass, the *latticinio* most usually employed in the filigree Venetian glasses, is only a glass coloured milk-white by oxide of tin or arsenic; under the denomination of *coloured glass* we therefore include the *latticinio*, as well as all other glasses coloured of different tints.

[4] A hollow iron tube about 4 feet long, lessened at the mouth and enlarged at the end, which is heated and placed into the pot of melted glass, or " metal." The glass instantly adheres to the iron, which is kept in constant rotation until the requisite quantity of " metal " is gathered.

strong heat, to weld the layers together, and next drawn out so as to form a cane of from $\frac{1}{8}$ to $\frac{1}{4}$ of an inch in diameter, the centre of which is coloured, surrounded by a very thin surface of white colourless glass. It is then divided or 'whetted off' into pieces of different lengths. These little canes, thus prepared and modified, by the flattening that takes place in the making of the vases form these simple threads, of various width, with which a number of the Venetian vases are enriched. They are also the elements of the canes with such varied filigree patterns, of which filagree vases are composed.

"The manufacture of canes enclosing filagree patterns is much more complicated and varies according to each pattern. It will be sufficient to know, that by placing in a given order canes (Fig. 1 H) of coloured glass, interspersed at greater or less distances, according to the pattern desired, with canes of plain white transparent glass, and by placing these canes, so arranged, either in a 'pocket' (chemise)[1] of soft white glass, or against the sides of a cylindrical mould (I), which is then filled with white melted glass (K), a thick column is formed in which the rods of coloured glass are distributed either in the interior or on the surface of the white glass (L). This column, which is then taken to the fire, in order to obtain a complete adherence of all the parts of which it is composed, is afterwards drawn out to form a little cane of white glass of from $\frac{1}{8}$ to $\frac{1}{4}$ of an inch in diameter, in which the canes of coloured glass are reduced to threads of extreme tenuity, which twist in varied patterns in the centre of the newly-obtained cane, or roll in spiral threads upon its surface, according to the previous arrangements, and the various inflexions which

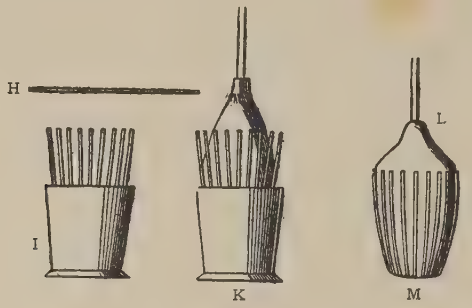

Fig. 1.

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[1] See also *Curiosities of Glass Making*, by Apsley Pellatt, for descriptions of the manufacturing processes of Venetian glass.

the workman may have given the material in the act of drawing it out.[1] Canes of glass with varied filagree patterns, prepared for the making of vases, are represented (Fig. 2).

"The glass-maker having provided himself with the different canes of

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[1] M. Bontemps published in April, 1845, an "Exposé des moyens employés pour la fabrication des verres filigranés." We shall transcribe here some of those which he points out for the making of canes with filigree patterns: "Pour obtenir des baguettes à fils en spirale rapprochés, qui, par leur aplatissement, produisent des reseaux à mailles égales, on garnit l'interieur d'un moule cylindrique, en metal ou en terre à creusets de baguettes de verre coloré à filet simple alternées avec des baguettes en verre transparent; puis le verrier prend au bout de sa canne, du verre transparent dont il forme un cylindre massif qui puisse entrer dans le moule garni de ces petites baguettes et chauffé préalablement, un peu au-dessous de la chaleur rouge. En chauffant ce cylindre fortement, il l'introduit dans le moule ou il le refoule de manière à presser les baguettes qui adherent ainsi contre le verre transparent; il enlève la canne en retenant le moule, et entraine ainsi les baguettes avec le cylindre; il chauffe encore et il marbre pour rendre l'adhérence plus complète; enfin, chauffant l'extrémité du cylindre, il tranche d'abord cette extrémité avec les fers, la chauffe de nouveau, la saisit avec une pincette, et la tire de longueur avec sa main droite pendant que de la main gauche il fait tourner rapidement la canne sur les bardelles de son banc. Pendant que l'extrémité de la colonne s'allonge, les filets de verre coloré s'enroulent en spirale autour d'elle. Quand l'ouvrier a amené à l'extrémité une baguette de la dimension voulue, environ 6 millimetres de diamètre, et que les filets sont suffisamment enroulés, il tranche avec la pincette, chauffe de nouveau l'extrémité de la baguette, et, la saisissant et l'étirant pendant qu'il roule rapidement la canne, il procède ainsi à la production d'une nouvelle baguette, et ainsi de suite, jusqu'à ce que toute la colonne soit étirée." Fig. 2 A and B are canes of threads more or less close obtained by this process.

"Pour fabriquer des baguettes qui, par leur aplatissement, produisent des filets en quadrilles, on place dans le moule cylindrique, aux deux extrémités d'un seul diamètre, trois or quatre baguettes de verre coloré à filet simple, alternées avec des baguettes en verre transparent; on garni ensuite la capacité intérieure du moule de baguettes transparentes, afin de maintenir les baguettes à filets colorés dans leur position, et on opère comme pour les baguettes precedentes." By this means are obtained canes like Fig. 2 F.

"Pour obtenir des baguettes produisant par leur aplatissement des grains de chapelet, on fait une paraison soufflée, dont on ouvre l'extrémité opposée à la canne, de manière à produire un petit cylindre ouvert; on l'aplatit afin de ne donner passage qu'à des baguettes, et on introduit dans ce fourreau cinq ou six baguettes à filets simples, alternées avec des baguettes de verre transparent; on chauffe, on ferme l'extrémité opposée à la canne, puis l'ouvrier presse sur la paraison plate pendant qu'un aide aspire l'air de la canne de manière à le faire sortir de la paraison et à produire un massif plat et dans lequel sont logées les baguettes à filets. L'ouvrier rapporte successivement une petite masse de verre chaud transparent sur chacune des parties plates de sa paraison, et il marbre pour cylindrer sa masse: il obtient ainsi une petite colonne dans l'intérieur de laquelle sont rangés, sur un même diamètre, les filets colorés; il procède ensuite, comme pour les baguettes précédentes, en chauffant et étirant l'extrémité pendant qu'il roule rapidement la canne sur les bardelles. Par ce mouvement de torsion, la ligne des filets colorés se présente alternativement de face et de profil, et produit des grains de chapelet."

One may imagine that the canes of coloured glass placed in the centre of the column, being, by the motion of twisting, crossed one upon the other, appear to represent the beads of a rosary formed of threads, leaving between them a colourless space obtained by canes of transparent glass which alternate with canes of coloured glass. A cane obtained by these means is to be seen (Fig. 2 G).

"Il arrive souvent que l'on combine les grains de chapelet avec les quadrilles des baguettes coloured filagree, and plain white glass, may now proceed to the fabrication of vases. He arranges around the inner surface of a cylindrical mould, formed of the stoneware used for a crucible, or of metal, as many canes as he requires to form a complete circle round the sides of the mould. These canes are fixed to the bottom of the mould by means of a little soft earth which has been spread over it. The workman can choose his canes of various colours and patterns, forming so many different combinations of filagree; he can place them alternately, or can inter-

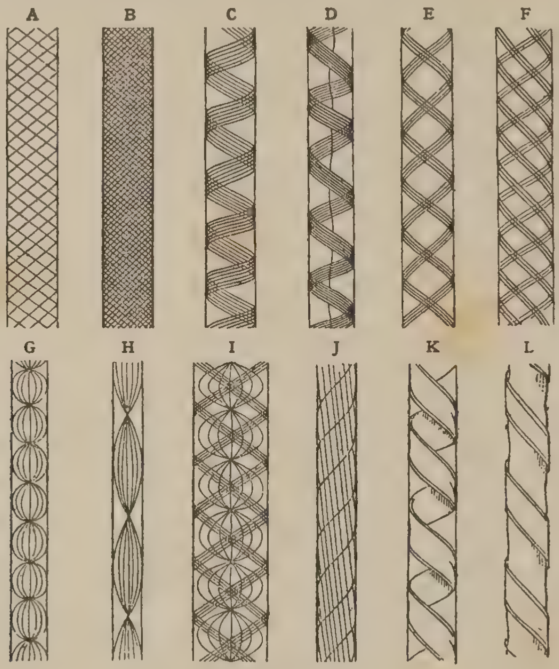

Fig. 2.

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précédentes, en se servant, pour introduire dans le moule préparé pour les baguettes à quadrille, du cylindre préparé pour les grains de chapelet." We shall then have the cane (Fig. 2 I).

" Quelquefois on ménage, au centre d'une baguette, un filet en zig-zag : pour cela on prépare un premier cylindre massif en verre transparent, de moitié du diamètre de celui qu'on veut étirer, et on fait adhérer, parallèlement à l'arête de ce cylindre, une petite colonne colorée ; on recouvre le tout d'une nouvelle couche de verre transparent pour produire un cylindre de la dimension voulue pour entrer dans le moule des baguettes à filets. La petite colonne colorée n'etant pas au centre du cylindre, tournera en spirale autour de ce centre par le mouvement d'étirage et de torsion, et produira un zig-zag par l'aplatissement." Fig. 2 D is a cane thus prepared.

sperse them with canes of plain white glass. The canes being thus arranged, are heated in the glass furnace; the glass-maker then gathers, with the blowing-iron, a small quantity of white glass, to make a solid ball, with which he fills up the empty space formed by the circle of rods which cover the inner surface of the mould; he blows again to make the rods adhere to the ball of plain glass, and takes it all out of the mould. The assistant workman instantaneously applies upon the coloured or filagree canes, which are thus made to form the exterior surface of this cylindrical mass, a string of soft glass, in order to fix them more securely together. The piece being thus arranged at the end of the blowing-iron, the glass-blower carries it to the mouth of the furnace to soften it, to weld all its parts together, and to give it sufficient elasticity to yield to the action of the blowing-iron; he then rolls it on the marver, and when the different canes, united by blowing and manipulation, have reached such a point as to constitute a compact, homogeneous mass, he cuts with a kind of pincers, a little above the bottom, so as to unite the canes in one central point. The vitreous mass thus obtained is then treated by the glass-maker according to the ordinary processes, and he makes of it, according to his taste, a ewer, a cup, a vase, or a goblet, on which each cane, either coloured, or with a filagree pattern, serves to form a stripe. (No. 9.)

" If no twisted movement has been given to the vitreous mass in the course of fabrication, the threads of coloured glass on the filagree designs remain in a straight line, proceeding from the lower part of the vase to the upper, or else from the centre to the circumference. If the ball, on the contrary, has been slightly twisted, this twisting then imparts to the different coloured threads or filagree patterns which have entered into the composition of the vase, that spiral direction so often met with in specimens of Venetian glass.[1] The glass-makers of Murano gave this twisted work (*torsinage*) the name of *ritorcimento* (Fig. 4).

" The Venetian glass-makers succeeded also in making vases composed of two cases or sheets of glass, with simple coloured threads, which were twisted beforehand, and then placed over each other. This superposition, by which the threads of coloured glass were crossed at right angles, produces a network of opaque threads (Fig. 3), which, in consequence of their thickness, leave between each mesh of this kind of net a small bubble of air, enclosed between the two layers of white glass, which form the foundation of the vase.

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[1] To make a twisted or spiral cane, the pucellas, or pinchers, holds the apex (Fig. 1 M) in a fixed position, while the ornamental mass still adherent to the blowing-iron is revolved during the drawing till the requisite twist is given.

"These pieces are, perhaps, the most remarkable performances of the glass-makers of Murano. As yet no attempt at imitation has been entirely successful. M. Bontemps thought that these vases might be produced by blowing a first ball of glass with single twisted threads, then a second with single threads twisted the contrary way; that one of these balls should then be opened to introduce the other, so as to make them adhere; that the threads of coloured glass would then cross each other, and thus produce meshes of equal size, supposing the two balls to have been well prepared[1] (Fig. 3). (Nos. 14 B and 15 C.)

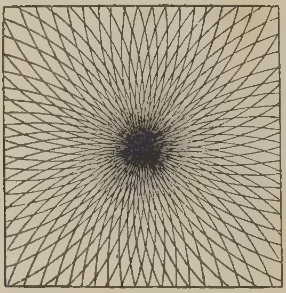

Fig. 3.

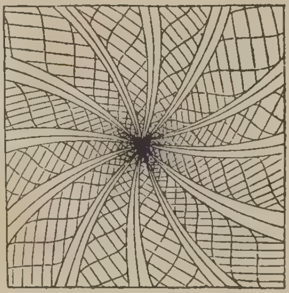

Fig. 4.

"They must, indeed, have a perfect similarity, very difficult to obtain, in order to ensure success by such a process. M. Carrand, who has deeply studied the subject of Venetian glass, thinks that vases of this kind were formed by a single ball; and suggests the following as the process employed; the glass-maker blew a ball of glass of single coloured threads, so as to take the form of a globe; he next gave a twisted movement to the blowing-iron, to give the coloured threads a spiral direction; and he then pushed up one hemisphere of the globe within the other (as might be done with an inflated bladder), so to bring it to the shape of a cap. The one hemisphere would then form, as it were, a lining to the other, and the threads of coloured glass would naturally cross each other."

(2) SCULPTURE.

The Romans carved or sculptured glass in the same way that cameos had been cut, and rock crystal and other stones carved in still earlier times. Amongst the most beautiful art treasures of the world are the Portland Vase in the British Museum and the amphora which was found in 1837 in Pompeii and which is now in Naples. The bodies of these glasses are made of two layers of glass, one superimposed upon the other, the lower one blue, the upper one white. They are sculptured by cutting away part of the upper layer with the lapidary's wheel, leaving the wonderfully modelled design in low relief. In some parts of the Portland Vase delicate shadows are obtained by cutting the outer layer so thin as to allow the blue of the lower layer to appear through the white. These vases are believed to have been made somewhat earlier than the middle of the 1st century.

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[1] Bontemps: *Exposé de le fabrication des verres filigranés*, p. 8.

(3) THE USE OF GOLD FOIL.

This means of decoration was first employed by the Alexandrian Greeks in the 1st century. Two beautiful examples taken from tombs of Canosa, now in the British Museum, are thus described by Dillon :—

" The two graceful bowls, decorated in gold with an exquisite design of acanthus leaves, combined with a small plant with tendrils, both radiating from a central flower, even in their present condition, perhaps surpass in beauty any other known example of ancient glass. From the technical side, the marvellous skill with which the two shells of glass of which these bowls are built up, are fitted together, should be carefully noted. It will be observed that the inner shell projects considerably beyond the outer one, and that the latter at the line of junction has been apparently levelled down by subsequent grinding. How far the two layers have been soldered together by subsequent firing, it would be difficult to say. Between the two shells, the gold leaf that forms the base of the decoration has been applied. We are reminded (but *longo intervallo,* not only artistically but technically also) both of the so-called cemetery glass of later date, and of the ' doubled glasses ' made in the eighteenth century in Bohemia."

Of the so-called cemetery glass Dillon writes :—

" In the preparation of these *vetri a fondi d'oro,* the gold leaf was laid down upon the glass with some gum or varnish ; the superfluous gold was then scraped away, and the internal lines of the draperies accentuated with a sharp metallic point ; a covering of glass was then superimposed. So far all are agreed ; but as to the actual process by which the two sheets of glass were united, there is some difference of opinion. The problem had already appealed to Heraclius, the writer of some barbarous hexameters treating *De Coloribus et Artibus Romanorum.* Heraclius was probably a monk living at Rome, perhaps about the end of the tenth century. The fifth of his little didactic poems is inscribed '*De fialis auro decoratis.*' In this he tells us how he produced some small cups of pure glass, smeared them with gum with a brush, and then proceeded to lay down on them leaves of gold. On the gold leaf, when dry, he inscribed birds, men, lions, as it pleased his fancy. 'Finally,' says Heraclius, 'I fitted over the surface, glass rendered thin by a skilful blast of the fire; but when the glass had yielded equally to the heat, it united itself admirably to the phials as a thin sheet.'[1]

"Theophilus, writing a few generations later, probably in Germany, knew nothing of this cemetery glass. He describes, however, the process by which the Byzantine Greeks made their gold mosaics by sprinkling a layer of powdered glass over the gold leaf covering the surface of the tesseræ; this coating was then fused on. But this was an enameller's process, and the coating must have consisted of a somewhat fusible glass, perhaps containing lead. The Greeks employed, he tells us, a similar process in decorating their glass cups.

"Signor Andrea Rioda, the art decorator of the *Impresa Venezia-Murano,* tells me that in the case of some clever imitations of the *fondi d'oro* made by his firm, the gold leaf was fixed upon a thickish sheet of glass, a thinner sheet was then placed over it, and the whole heated to the softening-point. A third method has been adopted in the preparation of some experimental imitations made by Mr. Westlake; that gentleman soldered together the two sheets of glass round the edges only, by means of a flux.

"In the general treatment of the figure, and in the choice of the subject, we are reminded in the case of this cemetery glass of the reliefs upon contemporary Christian sarcophagi—that is to say of the more rudely executed of these reliefs. But among these *fondi d'oro* there is a small class of portrait heads, highly finished by means of a sort of *pointillé* or stipple process, which are of a somewhat superior artistic merit. In these circular medallions—miniatures, we might call them[1]—the large eyes, the small mouth, and a peculiar affable but sad and 'worn-out' expression, remind us of the portrait heads on late mummy cases brought from the Fayum. These highly finished miniatures are probably of somewhat earlier date than the typical glass from the catacombs.

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[1] " . . . quo facto desuper ipsas
Armavi vitrum docto flatu tenuatum
Ignis; sed post quam pariter sensere calorem
Se vitrum fialis tenuatum junxit honeste."

These lines, which describe the critical process by which the superficial layer of glass was applied, are unfortunately somewhat obscure. If I have translated them aright, the process did not differ much from that now adopted at Murano. Heraclius is here probably copying an older recipe.

"We find occasionally in this cemetery glass a sparing use of coloured enamels, above all on the draperies.[2] In others the outlines, it would seem, were cut into the glass and filled up with coloured pastes, a process of great technical interest; I have not, however, myself seen an example of such work."

The Germans of the early 18th century revived the methods adopted by the Alexandrian Greeks. Glass thus decorated by the Germans is known as "Zwischen gläser." Of these glasses Dillon writes :—

"The plan adopted in no way differs in principle from that made use of in the decoration of the beautiful bowls from Canosa, now in the British Museum.[3] Very inferior to these in artistic merit are the little footless tumblers, with designs in gold, often hunting scenes, which seem to have been made on both sides of the Silesian-Bohemian frontier before the end of the seventeenth century. These are built up of two glasses, both somewhat tapering and both cut into an equal number of perpendicular sides, so that when the smaller of the two was inserted into the interior of the larger the glasses fitted exactly, and could not rotate one upon the other. The inner glass being somewhat the taller, we find the ring of junction, which is generally concealed by a band of gold, about half an inch or so below the top of the glass. The edges are so exactly bevelled that this line of junction is barely perceptible even to the touch. Before fitting the two glasses together, the inner one had been coated on the outside with gold-leaf, and the design carefully engraved on the gold with a steel point; while on the inside of the outer glass a coating of old linseed oil or of varnish had been smeared. I should add that a medallion of ruby glass, variously ornamented, is usually found at the bottom of these tumblers inserted between the two layers of glass, or sometimes replacing the base of the outer cylinder. These glasses will not stand warm liquids: an example in the British Museum is disfigured by some large flattened blisters, probably the result of heat.[1] Glasses built up in this manner may of course be decorated in other ways; the gold-leaf, for instance, may be replaced by silver foil. Kunckel, of ruby-glass fame, describes a method in which the inner glass is plainly gilt, while the outer one is painted on the inside in imitation of precious marbles (*Ars Vitraria Experimentalis*, 1679). I have seen examples of this manner of decoration in German museums."

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[1] There is a good example, a bearded man, in the Glass Room at the British Museum. Some clever imitations were made in the 18th century.

[2] As examples of this, note the gladiator glass and the *Anatoli Gaudens* portrait from the Tyskiewitz Collection. This last example, of quite exceptional merit, has been recently acquired by the British Museum.

[3] On the other hand, the technique of the cemetery glasses differs essentially, as in these the two plates of glass are fused together, on the edges at least.

(4) ENGRAVING.

(*a*) *Engraving with the wheel.* Wheel engraving has been practised from early Roman times. A description has been given previously of the Portland Vase, made probably in the 1st century, on which the work is similar to that done by the early carvers of cameos. At a much later date we have the Hedwig glasses, which are deeply cut and whose origin is unknown, but which certainly were made some centuries before the Germans learned the art from the Italian carvers of rock crystal, who at the end of the 16th century were working for the Emperor Rudolph II at Prague. It was there that Gaspard Lehmann and Zachary Belzer worked from 1590 to 1622. They were carvers of crystal who found the means to do similar work on glass.

Differentiation should be made between deep carving and surface cutting. We have seen that the former was practised from very early times. Towards the end of the 17th century the Germans not only excelled in this work, but they developed surface cutting, both the cutting of facets and the finer decorative engraving. There are no finer examples of this decorative engraving than those made by the Germans from the end of the 17th century and by the Dutch during the following century.

Dealing with technique of glass engraving, Dillon writes:—

" . . . before the end of the seventeenth century the arrangement of the wheels and the division of labour were probably on the whole established much in the manner that we find in local works in Bohemia at the present day. In a general way we may say that there has always been a distinction between the mechanical processes of grinding and polishing and the more delicate and artistic work of the engraver. In the latter case the work is done by pressing the glass against the edge of a minute copper wheel.

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[1] We often find similar defects developed on glass lenses. To ensure achromatism and accuracy of definition these lenses are built up of two layers, one of crown, the other of flint glass, cemented together by a varnish.

On the other hand, the glass is ground down on a wheel of iron from three to eighteen inches in diameter, it is smoothed upon a stone wheel and finally polished upon one of wood, with the assistance in each case of suitable abrading mediums, whether emery, quartz sand, tripoli, or putty-powder.

" As early as the seventeenth century these *glasschleifer* were divided into several more or less independent groups. The *eckigräber* did the coarser work. It fell to them, in the first place, to remove all irregularities on the surface of the glass—for example, the rough projections left on the foot where the pontil had been attached—and more especially to make the cross cuttings required to form the facets, which at a later time were so much in vogue. The *kugler* were another class of workmen, who prepared the shallow circular or oval pits which play so important a part in the decoration.

" The work of the actual engraver belongs more to the domain of art. The cutting in this case is effected by a little wheel of copper from a quarter inch to an inch in diameter, revolving rapidly at the end of a horizontal spindle, moved by a treadle. These little copper wheels are of various forms, and not the least part of the skill of the artist lies in the selection of the form most suitable to the work in hand. The decision as to the depth of the engraved line, and again as to which part should be polished and which left dull, depends also upon his judgment. His difficulties are increased by the fact that he is unable to follow the progress of the work in hand, for not only has he to press the glass against the under surface of the wheel, but the part of the surface on which he is working remains covered by the emery or other abrading material employed (*Von Czihak*, pp. 136–139). It will be noticed that as a rule the incised parts are left unpolished and dull as they come from the wheel, and that the polishing is reserved for the little circular depressions, the *kugeln*, which then show out like jewels cut *en cabochon*."

(*b*) *Engraving with the diamond point*. This process is simply that of scratching (or stippling) the surface of the glass with a diamond. Johann Mathesius (1504–1565), the friend and biographer of Martin Luther, records, in what appears to be the first reference to diamond-point engraving, that it was first employed in Silesia upon glasses imported from Venice. Robert Schmidt suggests that diamond engraving may have been done first in Venice; whilst in the opinion of A. M. Pareau we must look to Nuremberg for its inception. In Motley's *United Netherlands* is an interesting allusion to diamond-point engraving. Huguenot leaders in a letter to Henry IV in 1594, at the time of his " conversion " to the Roman Church, wrote:—

> " It will be difficult to efface very soon from your memory the names of the men whom the sentiment of a common religion, association in the same perils and persecutions, a common joy in the same deliverance, and the long experience of so many faithful services, have engraved there with a pencil of diamond."

The earliest dated example of diamond engraving of which I am aware is a glass dated 1570 in the Castle of Darmstadt. Next follows one in the Cluny Museum with initials, three fleur-de-lis, and the date 1578. Then come in order two glasses dated 1580 and 1581 in the writer's collection, one with a Dutch inscription dated 1581 in the collection of Mrs. Snouck Hurgronje at The Hague, one dated 1583 in the possession of Mr. Hamilton Clements, one dated 1586 in the British Museum, one dated 1590 in the Rijks Museum, Amsterdam, and another belonging to the writer dated 1594. It is of interest that the designs on most of these glasses bear marked resemblance, suggesting that they were made by Venetians living perhaps in different countries. It it to Holland in the 17th and 18th centuries that we must look for the most exquisite examples of this art. Here engraving with the diamond point was done not only by line but by stippling, the design being made by means of dots made with a diamond point and a small hammer. Dr. Hudig has dealt with this form of decoration as applied in the Low Countries. In his article he mentions that the Romans decorated glasses by scratching the surface, probably with a flint.

(c) *Engraving with fluoric acid.* Engraving, or to be more exact, etching or eating a design into the surface of glass by the fumes of hydrofluoric acid, seems first to have been done by Henry Schwanhardt, son of Johann Schwanhardt of Nuremberg, towards the middle of the latter half of the 17th century, for there is the contemporary evidence of Sandrat, writing before 1675, that Schwanhardt engraved by the use of a " corrosiv," a statement repeated with details by another writer, Doppelmayr. Schwanhardt covered parts of his glasses with a varnish or wax, drew his lines or stippled through the covering with a steel point, and allowed the acid fumes to affect the uncovered parts of those bared by the steel. No glasses are known to the writer that were decorated by this process prior to the 19th century.

(5) SURFACE IRREGULARITY.

The Venetians from the 16th to the 18th century made what is usually known as Ice glass, owing to its appearance. The effect was obtained by dipping for a moment the still warm vessel into cold water, by which means innumerable small fissures appeared on its surface which were smoothed by further heating and lightly blowing. Robert Schmidt (*Das Glas*, p. 110) points out that a similar effect is achieved by rolling the glass over a quantity of small glass splinters which melt on to the surface and which are made blunt by reheating.

(6) COLOURING.

(*a*) *With enamel*. If again one refers to Dillon's *Glass*, one reads that:—

"... In a true enamel, as the term is used in ceramic and vitreous art, the coloured decoration is applied to the glassy surface (either glaze or glass body) in the form of a pigment worked up with water or other liquid. Such enamel paints are composed, in later times at least, of a base of silicate of lead (the flux), coloured by various metallic oxides. It is essential that these enamels should be more fusible than the body on which they are painted, so that when subjected to the heat of the muffle-fire they may be completely fused, while the glass or glaze on which they rest is not more than superficially softened. Such enamel decoration, whether on porcelain or on glass, may vary from a mere wash of colour on the one hand, of which it is sometimes difficult to say whether it has ever been subjected to the heat of the muffle-fire, to a true vitreous covering on the other, where the various colours stand out in relief like so many jewels."

The Romans made use of enamels, but not very successfully. For the true development of the art one must turn to the Saracens of the 14th and 15th centuries, although an important example of unknown origin, probably dating from the 3rd or 4th centuries, is to be seen in the Treasury of St. Mark's, Venice. Enamelling may have been done by the Venetians as early as 1300, but it was not until the middle of the 15th century that they did it extensively. The Venetians carried the art into France, where enamelling was done early in the 16th century. It was done in Spain perhaps at the end of the 15th century. In Dillon's opinion the art may not have been learned by the Spaniards from the Venetians, but direct from Saracenic or Jewish glass workers in some of the ports in the Levant. In Germany, Mathesius writes in 1562 of enamelling as a new art. The earliest dated German example is dated 1553 ; one in the writer's collection is dated 1562. Enamelling does not appear to have been done in England until the second half of the 18th century. The writer has an example dated 1763, which is the earliest dated English example of which he knows.

(*b*) *Painting that was not fired.* In the 16th century in Venice and at Hall in the Tyrol glasses were decorated with oil paint and gold. An example in the writer's collection has a base of gold or silver beneath the oil paint, the latter covered by a thin transparent varnish. Such work is described by the Germans as Kalter Malerei (cold painting).

The Venetians in the same period also decorated glasses by painting on the underside of the glass, the gold decoration being applied sometimes with the brush like any other paint. The paint may have been " fixed " at the time by a transparent varnish. The writer has had bitter experience, inasmuch as he attempted to wash a large Venetian dish similarly decorated on which no trace of fixative remained. Similar painting was done in Germany early in the 17th century.

(*c*) *Painting that was fired.* Towards the middle of the 17th century Johann Schäper, who came in 1655 from Harburg on the Elbe to Nuremberg, where he died in February, 1670, was one of the first to decorate glasses *en grisaille*, an example that was followed by other artists. Usually one colour only was used, light or dark sepia. Four bottles exist that are painted with two shades of red in addition to sepia ; two of these are in Berlin, and two in the collection of the writer. In one of the latter yellow is used also. These paints were fired and fixed on the glass. The work of Schäper and his contemporaries, known as Schäper-gläser, forms a distinct school.

CHAPTER THREE

DESCRIPTIONS AND NOTES

An attempt has been made to classify the glasses under review, first according to the country of their origin, and then in relation to the date of their production. In many cases this classification can be made with comparative certainty, but in some neither the country of origin nor the date can be determined definitely. Certain influences have pervaded various countries, such as that of the Italian glass workers; glass of similar composition has been used at so many glass furnaces, and the fashions of one country have had their effects upon the fashions of others to such an extent, that those who have studied the subject agree that there must be disagreement and sometimes comparative ignorance in regard to the provenance and date of many glasses. For these reasons a warning is given against too great a reliance being placed upon the opinions expressed in the following descriptions, although in no doubtful case has an opinion been offered without careful consultation with those well qualified to judge.

EGYPTIAN AND PHŒNICIAN GLASS

The Egyptians and Phœnicians are believed to have been the earliest makers of glass. They employed similar methods. It is known that glass was made in Egypt during the Eighteenth Dynasty (say between 1600 and 1500 B.C.). For a thousand years afterwards it was made by a primitive process in which blowing formed no part. Alexandria seems to have been the chief Egyptian centre of glass making in the first centuries before the Christian era.

1A. AN IRREGULAR BEAD, about 1 inch in diameter and 7/8 of an inch high, studded with a number of small circular green glass pellets.

1B. A TRANSLUCENT BEAD the colour of lapis lazuli, 7/8 of an inch in diameter and 3/4 of an inch high, studded with red and green pellets.

1C. A BEAD, 1 inch in diameter, with brown cartouches on which are small blue spots encircled with white. Broken.

Alexander Nesbitt, in the catalogue of the Slade Collection (1871), describes this class of bead (1A, 1B, 1C) as probably "the earliest product of the industry of Phœnicia in the art of glass making, which have been found in almost all parts of Europe, in India and other parts of Asia, and in Africa." . . . "Their wide dispersion may be referred, with much probability, to their having been objects of barter between the Phœnician merchants and the barbarous inhabitants of the various countries with which they traded."

These beads were purchased from Pekin and have been recovered from tombs in China.

1D. AN AMPHORA, 3½ inches high with pointed base and two handles. The ground and handles are dark blue. Around the body are yellow and turquoise zigzags and yellow bands.

Phœnician or Egyptian. *3rd or 4th century B.C.*

In such glasses as these the coloured glasses forming the patterns are incorporated with the surface of the vessels and do not penetrate through their entire thickness.

ROMAN GLASS

Roman glass does not appear to have been made before the discovery of the art of blowing. Dillon (*Glass*, p. 3) gives it as his opinion that " When and where this discovery was made we do not know—perhaps somewhere in Syria or Mesopotamia, in the third or second century before Christ." He adds that " The art of blowing glass was known, no doubt, if not fully developed, at the time when the kingdoms of the Ptolemies and of the Seleucidæ fell under the rule of the Romans. By them it was before long brought to perfection and carried into every corner of the West, so that by the second or third century of our era the production of glass in Europe was probably greater than at any subsequent time, at least until quite recent days." During the period of the Roman Empire the art of glass making reached a very high pitch and almost all methods of decoration now known were in use. After the fall of the Empire glass making was continued in many localities throughout Europe, but for almost a thousand years it was carried on in the woods where little glass of artistic interest was produced.

The word " Roman " is used as a generic term and applies to glass made under the influence of the Romans throughout Europe (and in Western Asia).

2A. A Cup, 3¼ inches high, that expands towards the mouth, which is 3¼ inches in diameter. Around the outside are a number of slight lathe-cut lines. *1st century B.C. to 3rd century A.D.*

2B. A square Bottle, 6⅜ inches high, with a round neck and a three-lobed handle that is applied to the shoulder of the body and to the neck. *1st century B.C. to 3rd century A.D.*

2C. A Cup, 3 inches high and 4 inches in diameter at the mouth, on which are three small round deep green bosses equidistant from each other. *1st century B.C. to 3rd century A.D.*

2D. A Vase, 5¼ inches high, with a neck 1⅞ inches long, beneath which is a globular body with four deep depressions, which form four concave sides. Covered with iridescence. *1st century B.C. to 3rd century A.D.*

Iridescence on glass is caused by the action of the carbonic acid or the ammonia salts contained in the air or the earth which, in the presence of moisture, decomposes the glass, forming soluble carbonate of soda or of potash. As this is washed from the surface of the glass there remain small scales or flakes of an acid silicate of lime, alumina or lead, as the case may be, which break up the rays of light, thus giving the iridescent effect.

2E. A VASE, 6¾ inches high. Beneath the slightly expanding neck, which is 3 inches long, the body is globular. Covered with iridescence.
1st century B.C. to 3rd century A.D.

2F. A VASE, 5½ inches high. The neck, 2½ inches long, has a broad flange at the opening. Below the neck the body has a shoulder and expands until it curves inwards to form the base. Covered with iridescence.
1st century B.C. to 3rd century A.D.

3A. A SMALL URN, 3 inches high. The mouth is 3½ inches in diameter. The sides slope outwards from immediately below the rim until near the base. Around the middle of the bowl is a lathe-cut groove between two lines. Covered with iridescence. *1st century B.C. to 3rd century A.D.*

3B. A VASE, 5⅜ inches high. The lower part is globular and is delicately spirally moulded. The upper part is in the form of a broad cylindrical neck that expands and is shaped at the mouth. The upper and lower parts were made separately: at their junction the base of the upper part closes the lower except for a small hole. Covered with iridescence.
1st century B.C. to 3rd century A.D.

3C. A VASE, 4¾ inches high, with a short expanding neck, below which the body expands until it curves inwards to form a base. Covered with iridescence. *1st century B.C. to 3rd century A.D.*

3D. A BOWL, 6¼ inches in diameter and 2 inches high, of thick glass. The underside is heavily moulded with flutings. Covered with iridescence.
1st century B.C. to 3rd century A.D.

3E. AN UNGUENTARIUM, 7⅝ inches high. The tapering neck, 6 inches long, is surmounted by a flange; the body is bell shaped. Covered with iridescence. *1st century B.C. to 3rd century A.D.*

3F. A BOWL, 6⅛ inches in diameter and 1⅞ inches high. Around the inside, near the rim and towards the base, are lathe-cut lines. Covered with iridescence. *1st century B.C. to 3rd century A.D.*

4A. A CINERARY URN, 2¾ inches high, of purple glass. Surrounding the upper part is a projecting zigzag fillet of green glass attached to the upper part of the bowl and to the lip. *1st century B.C. to 3rd century A.D.*

4B. A CIRCULAR VASE, 5 inches high, with a short expanding neck. A lattice design is moulded on the surface, and there is an applied ring around the base of the neck. *1st century B.C. to 3rd century A.D.*

4C. A TWIN UNGUENTARIUM, 8¾ inches to the top of the handle. Wrapped around the body, which is 4 inches high, is a very delicate thread. The handle is composed of three parts, on either side are loops that spring from the lip which continue downwards in the form of snake-like applications, these two loops are joined at their tops by a third at right angles to the first two. *1st century B.C. to 3rd century A.D.*

4D. A TWIN UNGUENTARIUM, 5½ inches long, of amber tinted glass, with two small handles. It is formed by compressing a single tube lengthwise. Around it is a wrapped thread. *1st century B.C. to 3rd century A.D.*

4E. A PRÆFERICULUM of greenish glass, 8 inches high. Around the neck is a delicate thread. On either side are handles that spring from the upper part of the body and which touch the neck three times before being attached to the rim. *1st century B.C. to 3rd century A.D.*

We have extremely little knowledge of the manufacture of glass in China. In very early times Buddhist prayer beads were imported, probably after the Han Dynasty (206 B.C. to A.D. 220); they were made of agate, precious stones or of glass. In the third year of Yen Hsi (A.D. 160) the Roman Emperor sent an Embassy to China with tribute, which marked the beginning of the intercourse between the East and the West (K. C. Wong, in the *China Journal of Science and Arts*). Wong tells us that the History of the Sui Dynasty (A.D. 589–618) " contains a biography of Ho Chou in which it is stated that Chou was a great connoisseur and that in his opinion China lost the art of manufacturing glass for a long time, and no artisan at that time knew the secret, but that Chou made it by means of green porcelain.

" Yen Shih-ku (A.D. 581–645 of T'ang Dynasty), in his notes of the Han history, says that glass was then made by melting stone and adding various chemicals, but was very brittle. During the reign of the Emperor Tai Wei of Northern Wei (A.D. 420–451) a merchant of Great Bactria came to the Capital saying that he could make glass out of stone. Stone quarries were then mined, and the glass manufactured had a lustre better even than the genuine (imported ?) article. From these statements we may see that in the time of the Sui Dynasty the art of manufacturing glass was accidentally lost."

Between A.D. 1403 and 1431 Eunach San Pao, named Cheng Ho, went abroad and brought back to China a man who knew how to make glass.

Before the end of the 17th century glass works were established within the Imperial Palace at Pekin under the superintendence of Jesuit missionaries. After the accession of Ch'ien-lung (1736–1796) a glass worker named Hu became famous.

5A. A SEAL, 1½ inches high. The figure of a mythological animal is seated upon a rectangular base beneath which are carved hieroglyphics.

This has been carved from a block of glass: it is reported to have been removed from a tomb and may be of the T'ang period (A.D. 618–907).

5B. AN IRIDESCENT CIRCULAR DISC of green glass, 1⅝ inches in diameter, varying in thickness from ¼ to ⅜ of an inch. On the upper side is indented a Chinese character meaning " Foot-soldier." It was probably used as a pawn in the game of chess.

The writer has been unable to deduce even an approximate date for this disc. It may be very early.

5c. A SPHERICAL YELLOW BOWL, 7¼ inches high and 9¾ inches in diameter. On the upper half a conventional design is carved in relief.

Beneath is the date mark—the Nien-Hao of the reigning Emperor Ch'ien Lung (1736–1796).

ITALIAN GLASS

Glass has been made in Venice since the end of the 12th century, and we know that a century later there were furnaces in Murano, Treviso, Padua, Mantua, Ferrara, Ravenna, and Bologna. Apparently a great stimulus was given to the Venetian glass industry by the sack of Constantinople in 1204, at which time valuable examples were taken thence, some of which are still to be seen in the Treasury in St. Mark's. The Venetians before that date had established glass houses along the Syrian coast. We know that, early in the 12th century, when Sidon fell, they received from Baldwin, King of Jerusalem, in return for their assistance, a market-place, a district, and a church (Horatio F. Brown, *Cambridge Renaissance*, Vol. I). We have evidence of the manufacture of beads, hollow ware, mirrors backed with lead, glass lenses, little panes of thick window glass, etc., during the 13th century (Dillon, *Glass*, p. 178). The making of enamelled glass was introduced from the East, probably around 1300; but it was not until more than a century later that enamelling was practised extensively in Venice. In the 16th century the famous "cristallo" was perfected, which was capable of being blown thin and then worked into a great variety of shapes. Such glasses depend for beauty upon their grace of form rather than upon the ability of the enameller or engraver to provide them with decoration. Towards the end of the 17th century the supremacy in glass making passed from the Venetians, who failed to hold their own against the Bohemian and other glass cutters, who had introduced a fashion that the Venetians attempted to follow early in the following century.

The Italians from Venice and from L'Altare, a small town to the east of Genoa, where according to tradition a settlement of glass workers from Normandy was established in the 11th century, exerted a very great influence over the making of glass throughout Europe, for not only were their products in great demand, but their glass workers emigrated to almost all parts of Europe during the 16th century (there were Altarists in France in the 15th century), where they established furnaces for the making of glass "façon de Venise," which in turn influenced other workers in the countries where these furnaces were set up.

6A. A Dish, 12 inches in diameter. The edge is folded from above and contains a narrow clear blue ring. On the under side, $\frac{7}{8}$ of an inch from the edge, is applied a narrow raised wine-coloured ring. Between the blue and wine-coloured rings traces of gilding remain. The centre of the dish is a circular lozenge of wine-coloured glass, 3⅜ inches in diameter, on the surface of which is powdered gold. The clear glass of the dish covers the lozenge. On the under side twelve raised ribs spring from immediately beyond the lozenge. *Late 15th century.*

6B. A TAZZA, 10¾ inches in diameter and 2½ inches high. In the centre of the bowl, in red, white, yellow, and blue enamel, are the Arms of a Medici Pope; on the under side are raised gilded mouldings radiating spirally from the circle formed by the junction of the base with the bowl, and, towards the edge, which is folded from above, is a gold "fish scale" band, decorated with red, green, and white enamel dots. Below the bowl is a pedestal foot with the edge folded from above.

16th century (1513–1534).

The arms on this dish have reference either to Pope Leo X or to Clement VII. Leo X (Giovanni de Medici, 1475–1521) was Pope from 1513–1521. During his pontificate the signal for the Reformation was given by Martin Luther, when on All Saints' Eve, 1513, he issued his protest against the sale of indulgences, which were commissioned by Leo X, for the purpose of raising money for the rebuilding of St. Peter's. Clement VII (Giulio de Medici, 1478–1534) was Pope from 1523–1534. It was he who refused to sanction the divorce of Henry VIII from Catherine of Aragon.

In early times the Medici arms contained eleven balls. This number was diminished to nine, and again, when Giovanni di Bicci (b. 1360, d. 1428) was head of the family, to eight. In the time of Cosimo (Pater Patriae) (b. 1389; d. 1464) the number was seven. To his son Piero (il Gottoso) (b. 1416; d. 1469) Louis XI granted the privilege of stamping the lilies of France upon one of the balls for which reason one was painted blue the others remaining red as before. During the time of Piero's son Lorenzo (il Magnifico) (b. 1449; d. 1492) the number was further reduced to six, five red and one blue, this number being retained subsequently.

7A. A TAZZA, 11 inches in diameter and 2⅞ inches high. In the centre of the bowl is a conventional design in white enamel, enriched with gold, and blue, green, and red enamel dots. On the under side of the bowl are twelve moulded radiate projections coloured alternately gold, red, gold, blue, and, towards the rim, is a fish-scale band in gold, enriched by red, white, and blue enamel dots. The edge of the bowl is folded from above and is decorated by a narrow translucent blue thread. The foot is ¾ of an inch high and 4½ inches in diameter and has the edge folded from below with a translucent blue thread similar to that at the edge of the bowl.

Early 16th century.

7B. A BOWL, 11 inches in diameter and 5⅞ inches high, on a tall foot. The edge of the rim turns over and contains a translucent blue thread. On the outside of the bowl, 1 inch below the edge, is an applied ring of translucent blue; between the two blue rings remain traces of applied gold. Raised spiral mouldings radiate from the junction of the bowl and the foot. The pedestal foot is moulded and has an edge of translucent blue folded from below. *Circa 1500.*

8A. A CIRCULAR DISH, 8⅞ inches in diameter and 2 inches deep. The edge is folded from above. The flange is defined on the under side by a fine raised ring. Between the ring and the edge is applied gold decorated with white, red, and green enamelled dots. On the under side of the bowl are forty moulded raised ribs. Beneath the bowl is an applied ring forming a foot. *Circa 1500.*

8B. A DISH, 7⅜ inches in diameter, with a slightly conical centre. On the under side are forty moulded ribs that spring from the centre and extend to 1½ inches from the edge. Beyond the ribs is a single narrow trailed ring. On the under side of the flange is a gold band with a dentate edge, with gold removed so as to form the inscription "LEX SAPIENCIE FONS VITE." The edge is folded from above. Under the dish is a single trailed band that forms a slight foot. *16th century.*

9. A EWER, from which the base and the handle have been broken away, with a trefoil lip, 14 inches high from the bottom of the ovoid body, and 8½ inches in diameter at its greatest circumference. It has been constructed from canes of glass. Around the body, where it is widest, is a band consisting of four interlaced, fine white threads, with a white thread above and below. Above this band are alternate vertical strips containing, respectively, a single thread and four twisted fine white threads. Below the band are vertical strips containing three interlaced fine white threads which alternate with strips of yellow edged with brown, purple edged with darker purple, light blue edged with green, and strips of white with diagonal bars of yellow, blue, and purple. Below the body is part of a clear-glass collar from which project the ends of coloured canes, similar to those in the body, of which the base was constructed. *16th century.*

10a. A Tazza, 6 inches high, with an almost flat shallow bowl $7\frac{1}{2}$ inches in diameter. The lower half of the delicate baluster stem is a hollow knop moulded with lion's masks. On the plain foot has been engraved with a diamond "S. ALFONS. GALARA . . . CAP. DE. JUSTIA."

16th or early 17th century.

10b. A flat Dish, 14 inches in diameter, with the edge folded from above. The flange, which is $3\frac{1}{2}$ inches wide, is decorated in diamond-point engraving with a formal design of leaves and flowers. *Circa 1600.*

11. A bell-shaped Glass, $7\frac{3}{4}$ inches high, surmounted by a small silver-gilt bell, on which is engraved a coat of arms (three scollop shells) and crest. Immediately below the silver is a fluted knop which shows traces of gilding. Below the knop is a plain stem from which four scrolls spring. The upper part of the body is enriched with three gilded masks alternating with three gilt scollop shells; on each of the latter is a small gilded boss with a turquoise-coloured centre. The lower part has three raised flat gilded rings between which are gilded arabesque scrolls of foliage.

Circa 1600.

Opinions differ (even more widely than is frequently the case in regard to glass) as to the provenance of this bell. It may have been made in Italy and mounted at Augsburg, at Hall in the Tyrol, in the Netherlands, at Antwerp, or in France. As has been stated elsewhere, glass workers from Murano and L'Altare wandered throughout Europe. During the second half of the 16th century, as a contemporary writer states, "Tous les rois at princes désiraient et affectaient avoir en leurs royaumes cet science," that is to say, the science of making the Venetian "cristallo." Scheurmans has traced the wanderings of one "gentilhomme de verre" to London, Liége, Maestricht, Rouen, and Paris (Bulletins des Commissions Royales de l'Art et de l'Industrie).

The arms on the silver at the top of this bell (three scallop shells, which appear also on the sides of the glass) were granted in 1504 to the family of Eustache Leuillier, Seigneur de St. Mesmin. It may be that the glass was made in Paris, where, soon after 1552, Teseo Mutio was making glass which Henri II pronounced to be equal in quality to that made in Venice.

12. A flat Dish, 11 inches in diameter, with folded edge. In the centre are the Medici arms in gold. The whole is very finely decorated with diamond-point engraving. At the outside is an "egg and dart" border; towards the centre are two circular bands with mermaid-like winged figures and birds; and between each two bands of engraving, and outside the centre, are gilded bands each edged, top and bottom, with fine lines of opaque white glass, raised on the under side of the dish. *16th century.*

The arms on this glass have been partially erased. Sufficient remains to make it clear that they are those of the Medici family and that the pontifical insignia appear to be present. If the latter opinion be correct, the arms must be those of Pius IV (1559–1565), who, although unrelated to the Medici of Florence, assumed their arms on becoming Pope. The period of the pontificate of the preceding Medici Pope (Clement VII, 1523–1534) would appear to be too early, whilst that of the following Medici Pope (Leo XI, 1605) is improbable, inasmuch as Leo XI was Pope for only twenty-six days.

A dish similarly decorated is in the British Museum (Slade Catalogue, 184), to which Robert Schmidt alludes (*Das Glas*, p. 101) as " the most beautiful example of the XVI Century," but that in the British Museum is not so fine as this.

13A. A CANISTER, 9⅝ inches high to the top of the metal cover and 4¼ inches in diameter. It is hexafoil and is of mottled blue, green, and brown flecked with gold. It has a silver-gilt top and a metal stopper, both engraved with scroll work and fluting. *Probably 17th century.*

This is an example of what is known as " Schmelz " glass, for the making of which a formula is given in a Milanese manuscript of 1443.

13B. A BIBERON, 12½ inches high. The body is gourd shaped, the lower part being 7¼ inches and the upper part 4½ inches high, the latter surmounted by a finial. Towards the base of the upper part is a denticulated collar. A delicately fluted spout, 3 inches long, springs from towards the top of the lower part. A hollow, delicately fluted handle is attached to both parts. The denticulated base is blue, as are a small collar around the nozzle of the spout and a pressed trailed ribbon that is applied to the handle. The only opening to the bottle is the nozzle of the spout.

Probably early 17th century.

14A. A TAZZA, 6½ inches in diameter and 3⅝ inches high, on a short stem. The bowl is decorated with opaque white bands in geometrical design. Beneath the bowl is a single hollow member decorated with white bands. The pedestal foot, similarly decorated, has the edge folded from above.

16th century.

In this example the opaque white bands (lattimo) are smelted to the under part of the bowl, in the same way that the Romans applied white bands to some of their glasses.

Latticino, Lattisuol, and Lattimo are names given by the Venetians to opaque or milk-white glass.

14B. A Flat Plate of Vitro di Trina, 10⅜ inches in diameter, with a flange 2⅜ inches wide and an edge folded from above.

Very early 17th century.

An example of " Retticelli," or in German, " Netz-glas," as described in the chapter on Decoration (page 18).

15A. A Goblet, 6⅝ inches high, of leaden tint. The long straight-sided bowl, decorated by opaque white spiral ribbons, rests on a collar above a single hollow knop moulded with masks, etc. The edge of the round foot is folded from above. *Late 16th century.*

15B. A Goblet, 5⅝ inches high. The lower part of the bell-shaped bowl is decorated with a conventional design in a raised ribbon containing fine opaque white threads, above which are two rings (¼ of an inch wide) each composed of two fine white ribbons with the intermediate spaces decorated with fine opaque white threads. The stem is composed of a long hollow knop with smaller compressed ones above and below, the whole containing many very fine perpendicular opaque white threads. Above and below the stem are simple narrow collars of clear glass. The high foot has the edge folded from above and contains fine opaque white threads, like those in the stem. *Early 17th century.*

15C. A Goblet of Vitro di Trina, 6⅞ inches high, with a straight-sided bowl on a baluster stem above a round foot with the edge folded from above.

17th century.

An example of " Retticelli," or in German, " Netz-glas," as described in Decoration (page 18).

15D. A Wine Glass, 6 inches high, of light horn-like glass. The deep funnel-shaped bowl rests on a single hollow knop above a foot 3⅜ inches in diameter, with the edge folded from above. *Circa 1670.*

This was found in a Sussex farm-house and may be one of the many glasses imported by John Greene and his partner Michael Mesey between 1667 and 1672 from Signor Allescio Morelli, a Venetian glass maker. (See

Hartshorne's *Old English Glasses*, p. 228.) Among the drawings that still exist that Greene sent to Morelli with his orders is one almost identical with this in shape.

16A. A CUP AND COVER, 9½ inches high to the top of the cover. The lower part of the bowl is decorated with two parallel bands of blue wheeled stringings. On the cover, which is surmounted by a small finial with knops, is a blue chain-like decoration. Below the bowl is one slightly indented hollow knop between two collars. The foot is high and has the edge folded from above. *16th or 17th century.*

16B. A GOBLET AND COVER, 10 inches high to the top of the cover. The cylindrical bowl, 4¾ inches high and 2⅞ inches in diameter, is above a stem of which the chief feature is a hollow, fluted gilded knop. The edge of the low conical foot is folded from above. The cover is surmounted by a small finial the top of which has been gilded. *17th century.*

17. A GOBLET AND COVER of yellow tinted glass, 13⅝ inches high to the top of the cover. The base of the straight-sided bowl (3 inches high) and the top of the cover are covered by small round projections. The stem of the goblet and the finial surmounting the cover are composed of trailed glass with side projections, interspersed with beads of blue glass. The plain foot is round. *Probably early 17th century.*

18. A TAZZA, 11 inches in diameter and 3 inches high. The flat top bends upwards towards the rim. Towards the centre is a chain-like decoration in clear blue glass between two trailed rings applied on the under side. The rest of the top is decorated with a conventional design of flowers and leaves engraved on the under side with a diamond. Around the middle of the foot is a narrow double-trailed band. The base of the foot is 4⅜ inches in diameter; the edge is folded from above.

Probably engraved in the Netherlands. *Early 17th century.*

19A. A BOUQUETIER, 9 inches high. The delicate trumpet-shaped bowl is above a stem of which the chief part is an open circle 3 inches in diameter. The inner part of the circle contains twisted white, red, and yellow threads; outside are scrolls of clear glass picked out with purple dots. At the base of the circle, on either side, is a white five-petalled flower, above which, within the circle, is a small hollow glass ball ¾ of an inch in diameter. The circle is supported by a short hollow base decorated with purple dots. The foot has the edge folded from above. *17th century.*

19B. A Bouquetier, 8¾ inches high, with a shallow broad trumpet-shaped bowl beneath which is an irregular collar edged with blue, above two small fluted bulbs. The upper and longer part of the stem is a thin shaft containing a translucent blue thread. From the shaft project many narrow ribbed twisted leaves of clear glass about 2 inches long. The lower part of the stem is composed of a fluted knop above a short, shaped pedestal on either side of which is a blue scroll edged with clear denticulations. The foot is plain. *17th century.*

19C. A Bouquetier, 12¼ inches high, with a slender blue trumpet-shaped bowl 6¼ inches deep. The stem is composed of a twisted strand containing red, yellow, and opaque white threads the two ends of which are terminated by birds' heads with blue combs. Above and below the strand are moulded hollow bulbs. The edge of the foot is folded from above.

17th century.

20A. A Bouquetier, 6⅞ inches high, with a fluted bucket-shaped bowl, at the bottom of which is a wavy fillet, and on either side a delicate scroll. The slender hollow stem has five delicate bulbs. The foot is plain.

17th century.

20B. A Bouquetier, 7¼ inches high. The trumpet-shaped bowl is octagonal and has a blue scalloped edge. On either side of the bowl are delicate scrolls. The slender hollow stem is ribbed and is composed of six delicate bulbs. The foot is plain. (See remarks on No. 63.)

This glass suffers from "sickness." *17th century.*

20C. A Tazza Wine Glass, 6⅞ inches high, with a broad trumpet-shaped bowl decorated with a narrow wavy fillet near its base. On either side of the delicate hollow stem is a long simple scroll. The foot is plain.

17th century.

20D. A Tazza Wine Glass, 6 inches high, with a broad trumpet-shaped bowl decorated with a narrow wavy fillet near its base. The delicate ribbed hollow stem has bulbs, and on either side a long simple scroll. The foot is plain. *17th century.*

21. A Plate of opaque white glass (*latticino*), 8⅞ inches in diameter. The flange is undecorated; the middle of the plate is covered by a view of the Rialto in Venice, painted in red. *1738–1741.*

This is one of a set of plates brought by Horace Walpole from Venice in 1741; others of the same set are in the possession of Mr. C. Chute at The Vyne, Basingstoke; in the collection of Mr. F. Bodenheim, of Amsterdam; in the Victoria and Albert Museum, in the British Museum, and in the Schloss Museum, Berlin. The example in the Victoria and Albert Museum depicts the church of San Simione, a building that was begun in 1718 and completed in 1738. These are examples of white or opalescent glass, or *latticino*, made in imitation of porcelain. Similar glass was made in Venice early in the 16th century, in Germany in the middle of the second half of the 17th century, and a century later in England, in Bristol, where Michael Edkins decorated opaque glass sometimes in the Chinese style.

FRENCH GLASS

As in other parts of Europe, glass making has been carried on throughout France continuously since the days of the Roman Empire. During the period before the Renaissance the French glass furnaces made simple products, "verres de fougère," so named from the use of burnt ferns as a means of providing the necessary alkali. Again, as in other countries, the industry was raised to a higher plane through the direct influence of Italians from Venice and more markedly from L'Altare. During several centuries the French monarchs did much to stimulate glass making. There is an entry in the Comptes Royaux of 1382 which refers to a visit made by Charles VI to a furnace near the forest of Chevreuse.

Although it was not until about 1548 that the great emigration of the Altarists began, yet it is evident that the making of glass in France was influenced by the Italians a century earlier, for we hear of an Altarist, a member of the family of Ferro (an earlier member of the same family taught Venetian methods to the glass makers at L'Altare as early as the 14th century), who was working at Goult in Provence in 1443 for René, Duke of Anjou, Count of Provence and titular King of Naples (1409–1480), under whose patronage the first enamelled glasses were made in France. In 1511 glass, "façon de Venise," was being made at Lyon by Mathieu de Carpel. Gerspach quotes an interesting commentary made by Bernard Palissy towards the end of the 16th century, in which he complains that glasses had become so numerous and their price so low that the makers could not command a decent living, and that the glasses were hawked through the streets by those who sold old hats and scrap-iron.

Until the middle of the 17th century the better class of glass was made in various parts of France only by those who worked under royal privilege, who were almost always Venetians or Altarists. Yet the making of the finer glass met with difficulties. Henry II supported an unsuccessful venture in 1552, when furnaces were established at Saint Germain, and half a century later Altarists were called to France by Henry IV (in 1603) to direct glass houses that he had established in Nevers and in Paris.

In April, 1650, letters patent authorized the general manufacture of "verre cristallin," a privilege thus far accorded to special glass furnaces chiefly of Italian origin. But the home manufacture could not hold its own, without artificial support, against the importations from Venice, the Netherlands, Germany, and especially Bohemia, with the result that a tariff was imposed on foreign products on September 18th, 1664, which was further increased on May 29th, 1688, and again on September 7th,

1727. During the 18th century the French glass workers improved their standing and adopted various methods in use in other countries, such as the making of "flint glass," a process which had come into being in England in the latter part of the 17th century, but which was not perfected until some time in the 18th century. So late as 1771 Bosc d'Antic criticized the quality of the English flint glass, saying that it had not yet reached perfection; he found fault with its colour, its quality, and its price. Glass houses for the making of flint glass in France were established first at Sèvres in 1784, and then at Saint Louis in Lorraine about 1786.

22. A STRAIGHT SIDED GLASS, $6\frac{3}{4}$ inches high, slightly tinted leaden purple, tapering from $3\frac{1}{4}$ inches in diameter at the top to $2\frac{1}{2}$ inches in diameter immediately above the base. From the top of the base, which is 1 inch high, the line of the bowl is continued downwards until it spreads almost at right angles to form a foot $3\frac{15}{16}$ inches in diameter, of which the edge appears to be folded from above. Towards the top of the bowl is an enamelled band $\frac{3}{4}$ of an inch deep with borders at the top and bottom composed of white opaque spots and narrow red and blue lines. Between these borders are six scrolls in blue and white dividing the sentence "JE SU IS AV OU S," the letters being left plain on a gold background. On one side of the body of the glass is a cavalier $2\frac{3}{8}$ inches high, and on the opposite side a female figure $2\frac{5}{8}$ inches high, both in red, white, yellow, and blue enamel. Between the figures, on two narrow white ribbons, is written "FERME CUEUR" and "CÔTRE FORTUNE"; at the junction of the bowl and base is a circle of small white dots. On the under side of the foot has been engraved with a diamond "Found in a hole behind the Ivy in Stokefurie (?) Castle." *Circa 1520.*

This glass is of similar metal, bears the same inscription, "Je suis à vous," and is enamelled with similar figures, as a cup in the British Museum. There can be no doubt that the two glasses were made at the same period, in the same glass house. Garnier, in writing of the British Museum example (*Histoire de la Verrerie*, 1886), gives the opinion that it was made probably in the Goult furnaces established by King René in Provence, but adds that in reality one can affirm nothing, for during the reign of Henri II various glass houses were founded or directed by Italians in France, such as those of Poitou, of Dauphiné, of Saint Germain-en-Laye and later those of Nevers, of Rouen and of Paris, in all of which enamelled glasses were produced and of whose products so few examples survive.

23. A Mirror, 13½×9½ inches, made by the application of silver paper beneath the glass. On the under side of the glass is depicted the figure of a bishop being carried upwards by angels and cherubs. One of the latter holds a crosier, another a ribbon on which is the escutcheon of François de Sales (1567–1622). The decoration, which is very fine and delicate, appears to be obtained by the application of sepia on the back of the glass, which has been worked over by fine tools which have removed the paint where necessary and, in such places as the faces, have cut slightly into the glass, the whole giving the appearance of a delicate stipple and line engraving. Probably French; perhaps Italian. *Latter half 17th century.*

Francois de Sales (1567–1622), Bishop of Geneva, was a well-known devotional writer of the Catholic Church who was born in the Château of Sales, near Annency, in 1567. He received the tonsure in 1578 against his father's wishes, and Holy Orders in 1593, and subsequently became famous as a preacher. "My test of the worth of a preacher," he said, "is when my congregation go away saying not 'What a beautiful preacher,' but 'I will do something.'" From 1594 to 1598 he gave himself up to the task of working against Protestantism in Chablais. In 1598 he was appointed Coadjutor-Bishop of Geneva, and later he became Bishop. Under his direction, in 1610, Madame de Chantal founded an Order for the relief of the sick and poor, the only rules for which were to be "Charity and the love of Jesus Christ." In 1608 he published his best known and most valuable book, *Introduction à la Vie Dévote*. He died in 1622 and was canonized in 1665.

24a. A Bottle, of blue glass, 9¾ inches high, flattened and rectangular with concave corners and a shaped top terminating in a round neck. The back and front are decorated with an impressed design of the emblem of Mercury between conventional vases of flowers.

Probably made in the Auvergne. *Circa 1700.*

The writer has seen a similar bottle, of clear glass, on which the letter D was blown in the left-hand vase, and the letter R on that on the right.

24b. A Candlestick, 11¾ inches high. Below the bobêche (3 inches high) is a hollow, moulded, fluted baluster stem. The domed foot is 8 inches in diameter and has a hollow member 2½ inches in diameter that supports the stem. Perhaps German. *Second half 17th century.*

24c. A Lace maker's Lamp. At the top is a globe to contain oil, 2¾ inches in diameter, above a bobêche. The long handle is applied to the upper member of a pedestal which rests upon a tall shaped foot, with an edge so folded from below as to form two steps. *18th century.*

25A. A JUG, 10¼ inches high, with a hollow scroll handle and a shaped spout below which is an applied leaf ornament. The upper part of the bowl, which is straight sided, is decorated with a trailed band that encircles the bowl ten times; the lower part, which is rounded, is moulded and fluted. The bowl is separated from the base by a double collar. The base is round, with the edge folded from above. *Early 18th century.*

25B. A CANDLESTICK, 7¾ inches high, of moulded glass, with a shaped ribbed bobêche above a spirally incised knop. Below the shouldered pedestal stem are four collars above a high double-stepped moulded foot with a triple-ridged edge. *Early 18th century.*

25C. A CHALICE AND PATEN. The chalice is 8⅝ inches high. The bowl (2¾ inches high) is concave bucket shape. The pedestal has a large hollow knop above an elongated hollow shaped stem. The flattened domed foot is 3¾ inches in diameter and has the edge so folded from below as to form four narrow steps.

The paten is 6½ inches in diameter. It has the centre sunk to fit the foot of the chalice, and the edge folded from above so as to form three narrow steps. *18th century.*

Chalices and patens of glass are mentioned in the Liber Pontificalis as being in use at the end of the 2nd century: St. Jerome writes of " the Lord's blood being borne in a vessel of glass " (Dillon, *Glass*, p. 9). There is a very fine enamelled French chalice of the early part of the 16th century in the Wallace Collection. The rubrics of the Roman Catholic Church require the chalice to be of gold or silver. The writer has been informed, but has been unable to verify the statement, that during the French Revolution special permission was granted for the use of glass chalices; if so these examples may be ascribed to that date.

SPANISH GLASS

But little literature exists which throws light upon the Spanish glass industry. A contemporary Arab historian narrates (according to the Introduction, prepared by Juan F. Riano, to the catalogue of Spanish objects of art shown at the South Kensington Museum in 1881) that Almeida was famed in the 13th century for its vases of iron, of copper, and of glass; whilst in 1324 the glass houses in Barcelona were so numerous that it was deemed unwise to permit more to be established, owing to the risk of fire. Glass workers from Venice and L'Altare had found their way to Spain. Schuermans has traced the names of more than twenty of them, some of whom had passed through the Low Countries. We are told that glass "façon de Venise" was made throughout the 16th and 17th centuries at Cadalso, in the province of Toledo, and at other centres. Whilst the glass of Spain shows the influence, in many respects, of the Venetian glass workers, it appears that the Spaniards drew direct from the Levant at least some part of the inspiration which is shown in their treatment of local forms. The enamelled glasses of Barcelona of the late 15th and 16th centuries show characteristics which probably resulted from contact with the Saracens, the enamel being laid on, as Dillon points out, with a loaded brush in such a way as to lie on the surface of the glass in thick semi-transparent masses. The prevailing colour is a beautiful apple green which was used much by the Saracens, whilst the decoration is generally of a formal floral character, often built up of sprigs radiating from a centre.

Jeronimo Paulo, in a manuscript of 1491, narrates that glass from Barcelona was sent to Rome and elsewhere which rivalled the product of Venice, a comment that was repeated by Gaspar Barreiros in 1569.

Before the end of the 17th century glass making in Spain had declined, in common with other industries.

Prevailing tendencies in Spanish glass are those of loading, if not overloading, it with projections, handles, and reliefs, and of maintaining the same forms from one century to another for some of which a Moorish if not a Byzantine origin has been found.

26A. A Candlestick of yellow tinted glass, 11 inches high. The bobêche is surrounded by three heavy trailed bands. Below the bobêche are two circles of projecting leaves beneath which are ornamental members. The hollow base is 5 inches high and is composed of five graduating undulations, the lower being 4¼ inches in diameter. Decoration is applied to the two upper undulations. *Early 17th century.*

26B. A GOURD-SHAPED JUG with lip, 6⅝ inches high, of dark green glass with some brown smears. Attached to the upper part is a handle on the outside of which is a raised fin-shaped moulding. On either side of the upper part is a prunt. Around both portions are twenty-six parallel raised bands that encircle the jug. The lower part has no foot and underneath is slightly concave. *17th century.*

GERMAN AND AUSTRIAN GLASS

In the Rhineland glass making has been carried on continuously since the days of the Romans. There exist examples made during the Merovingian and Carlovingian ages which help to demonstrate the continuous development of the form of glasses in use from Roman days until the present time. Originating in small thick vessels ornamented by "stringing" and by applied raised lumps or "Nuppen," technically called "prunts," these glasses developed through the 15th and 16th centuries into the Igel, the Pass glas, the Krautstrunk (so called in the 16th century by Mathesius, owing to its likeness to a cabbage stalk), and the celebrated Roemer.

As in other countries, the influence of the Venetian and Muranese glass makers was important, although perhaps it had less effect in Germany than elsewhere and did not obliterate national feeling.

The most important glass-making districts were those of Hesse, with the adjoining wooded regions, including Bohemia, and the neighbouring districts of Thuringia, Saxony, and Silesia. Here, amongst the forests, where wood was easily available, innumerable furnaces flourished; the history of glass making in these regions can be traced, in written records, since about 1400. Robert Schmidt (*Das Glas*) tells us that presumably the industry was still older in the western part of Germany, for it is recorded that in 1406 the glass makers in and around Spessart had to render statements to their overlord Graf Ludwig of Reineck.

Venetian methods had been introduced into Nuremberg furnaces in 1531, for a subsidy was granted to two potters, Hans Nickel and Oswald Reinhard, "to practise and manipulate the smelting and glass work according to their knowledge of the art of Venetian workmanship." During the same century attempts were made to introduce Venetian methods into Bavaria. A Venetian, Giovanni Scarpoggiato, worked in Munich in 1584, and at about the same time glass "façon de Venise" was produced at Cassel. Yet Mathesius writes in 1560 of the inferiority of German glass compared to that made by the Venetians. As late as April 12th, 1679, Prince Johann Georg II of Anhalt-Dessau concluded a contract with the Venetian Bernardo Marinetti, for whom he had sent from Vienna, in which city Venetian glass makers had worked since a glass house was erected by a Muranese, Onosorius, in 1428. This reference is by no means our earliest record of glass making in Vienna, for we read in the *Livre des princes d'Enenchel* that the corporation of glass makers took part in a fête given for the Prince Leopold at Christmas, 1221.

Mention should be made of an important glass house at Hall, near

Innsbruck, which was set up by Wolfgang Vitl, to whom a twenty-year privilege was granted on June 1st, 1534, by King Ferdinand. Many of the glasses made here in the latter part of the 16th century were engraved with the diamond and heavily gilded.

During the latter half of the 16th century and the 17th century Germans produced large numbers of enamelled glasses, which did not attain the high artistic standard set by the Venetians, applying this method of decoration, as well as that of engraving, to glasses of their own forms. Engraving on glass was developed from the middle of the 17th century until early in the 18th century, by which time Bohemian glass attained such eminence as largely to supersede Venetian glass. Indeed, we read that Venetian glass workers, early in the 18th century, returned from Bohemia in an attempt to introduce Bohemian methods into the territory that had been the artistic centre of glass making for three hundred years.

27A. A CYLINDRICAL BEAKER, 8¾ inches high. On either side are similar armorial bearings in red, yellow, grey, and blue enamel, between which is the date 1562. Towards the top is a band of fish-scale pattern in gold, with red and blue dots on the scales, with single bands of white dots above and below. The base is mounted in silver-gilt.

South German. *1562.*

This glass lacks a tall foot like that on No. 27B, which presumably has been broken off, and a 17th-century silver-gilt mount has been added in its place.

In the year in which this glass was made Mathesius wrote of enamelling as a new art. " The ready wit of man," he says, " is always finding something new: some have on the white glass painted all kinds of pictures and mottoes, and burnt them in in the annealing oven, as we find the ' counterfeits ' of great men and their arms painted upon the panes that are set in our windows." From this sentence Dillon deduces that the " origin of the enamelling that we find on the beakers of the German renaissance must be sought, not in the early XV and XVI century enamelled glass of Venice, but rather in the new method of colouring window glass that was at this time spreading all over Germany."

27B. A CYLINDRICAL BEAKER on a tall base, 11 inches high and 3⅛ inches in diameter. Towards the top is a band in fish-scale design in gold with blue enamel dots, edged, top and bottom, with fine white enamel dots. On either side is a coat of arms in blue, black, white and red enamel, and gold, above which is " M.P.I.E. 1580 " in gold. There are traces of gold at the junction of the bowl and the tall foot, the edge of which is folded from above. *1580.*

28. A Tazza, 4¾ inches high and 8¼ inches in diameter. The inside of the bowl is decorated with armorial bearings of the Fugger family in blue, white, red and green enamel, and gold, and, towards the rim, with a band of gold with blue and red enamelled dots. Below the bowl is a single hollow gilded knop on a tall foot with the edge folded from above.

Third quarter of 16th century.

The Swabian family of Fugger was founded by John Fugger, a master-weaver at Graben near Augsburg. By their energy they became very wealthy and of great influence. Charles V, who enjoyed the hospitality of the brothers Raimund and Antonius at Augsburg in 1530, created them princes, and in return for help that he received from them in his expedition in 1535, against the pirates of Algiers, he conferred upon them the right to issue their own gold and silver coinage. The privileges conferred upon the family by Charles V were confirmed and increased by Ferdinand II.

29. A cylindrical Beaker, 10⅝ inches high and 4⅞ inches in diameter, decorated with diamond-point engraving. Three bands of decoration encircle the glass. In the space between the uppermost and the second band (5¼ inches) are the figures of the Emperor and of the Seven Electors, with their respective escutcheons, and the date 1594, beneath an inscription in German. The space between the second and third bands (1⅞ inches) is divided into four panels, in each of which is an inscription. The base is slightly conical and has a rounded projecting edge. *1594.*

This type of glass is called a Willkom or salutation glass. It was used to greet a guest upon arrival. Such glasses were decorated frequently in enamel with representations of the Emperor of the Holy Roman Empire and of the Seven Electors (and rarely dated), and when so decorated are known as " Kurfürstengläser." The writer knows of no other example that has been engraved with the diamond point.

The inscriptions on this glass, with the exception of that in the fourth panel, are similar to those on some enamelled examples and may be translated as follows :—

Above the figures, " Representation of the Roman Emperor with the 7 Electors in their costume, office and rank," and in the four panels, respectively, " Thus in all his splendour sits His Imperial Majesty with the seven

Electors in goodly array as befits each one, in electoral dress, with indication of his office."

" The Archbishop of Mayence renowned as chancellor in the German land. So the Bishop of Cologne likewise is chancellor through all France. After him the Archbishop of Treves is chancellor in the 'Welsh' (i.e. Romance) border."

" The King of Bohemia, he is chief cup-bearer of the Empire for all time. Then the Palsgrave on the Rhine is high steward of the Holy Empire. The Duke of Saxony born is marshal of the Empire unelected. The Margrave of Brandenburg so worthy is chief chamberlain of the Empire."

" There has been an oversight—the rhymes which are written under the spiritual princes belong under the temporal, the rhymes written under the temporal princes belong under the spiritual."

Rudolph II (1552–1612), the son of Maximilian II, was Emperor of the Holy Roman Empire at the time this glass was made. In 1572 he obtained the Crown of Hungary; in 1575 that of Bohemia, with the title of " King of the Romans"; and in 1576, after the death of his father, he became Emperor. He was a weak man, absorbed in art, and gave little or no attention to the momentous affairs of State for which he was responsible. It was during his reign as Emperor that the antagonism between the Protestants and Catholics became so bitter as to lead, shortly after his death, to the " Thirty Years' War," which would have broken out in 1609 had it not been for the assassination of Henri IV of France.

30A. A CYLINDRICAL BEAKER AND COVER (Reichs-adler Humpen), 19¼ inches high to the top of the cover, on a flat bottom, 6¾ inches in diameter, with a gilded edge decorated with white, red, and blue enamel dots, which projects ⅜ of an inch beyond the bowl. The bowl is decorated in various colours in enamel with a crowned, double-headed eagle bearing, on its outstretched wings, the escutcheons of the members of the federation composing the Holy Roman Empire, and on its breast an Orb surmounted by a Cross. Above the eagle is the inscription " Das heilige Römische Reich mitt sampt seinen Bliedern," above which is a gold band with decoration in blue, red, and white enamel dots. On the reverse is a light formal decoration in enamel and the date 1604. The cover, surmounted by a finial, is slightly decorated in gold and white and red enamel. (Broken and mended.) *1604.*

This is an example of what is known as a Reichs-adler Humpen. Humpen is a generic term for the large cylindrical beakers that are ornamented with this or other designs. Mathesius says that "Narren-humpen" (fools'-glasses) would be a better name "for these huge beakers that no man can lift." This type of decoration varies but little. There is always the double-headed eagle with halos and crowns and wings outstretched. On each wing are six feathers, and on each of the feathers are four escutcheons above which are the names of the princes, cities, etc., to whom they belong, all members of the ancient Germanic Federation. Across the top of each wing are four more escutcheons, those of the Seven Electors and the eighth that of the Pope. Usually there is an Imperial Orb in front of the eagle's breast, and rarely this is replaced by the Crucifix (No. 31B). The arrangement for the disposition of the escutcheons on the wings is said to have been made by Otho III, who died in 1202.

The earliest example that bears a date (1547) was, in 1886, in the Franzensburg at Laxenburg, near Vienna.

30B. A cylindrical Beaker with Cover, 19½ inches high to the top of the cover, on a tall base, 6½ inches in diameter, the edge of which is folded from above. The body is decorated with a painted figure of a man on horseback, above which is a gilt band with scrolls and birds from which hang festoons. The costume of the man is Spanish. The cover is decorated in gilt and is surmounted by a baluster-shaped finial, at the base of which is a moulded hollow knop.

Perhaps made at Hall, near Innsbruck, or at Nuremberg. *Circa 1600.*

31A. A cylindrical Beaker, 9½ inches high. Around the centre the Emperor and Seven Electors and the date 1616 are depicted in coloured enamel. Above the figures is inscribed in white enamel: "3 GEISTLICHE . DES . REICHS . CHURFURSTEN : 4 WELTLICHE . DES . REICHS . CHURFURSTEN . ," and below: "1 . TRIER . 2 COELN . 3 MENTZ . 4 . KAISER . 5 . BOHEMEN . 6 . PFALTZ . 7 . SAXEN . 8 . BRANDEBURG . ." Above the upper and below the lower inscription is a diaper design in white with blue dots and a band of gold slightly decorated with blue and white dots. The edge of the base, which projects $\frac{5}{16}$ of an inch beyond the body, is decorated with white. *1616.*

A "Kurfürsten-Glas" made during the reign of Matthias (1557–1619), Emperor of the Holy Roman Empire, the fourth son of the Emperor Maximilian II. He succeeded his brother Rudolph II upon the death of the latter in 1612 and died on March 20th, 1619. The Thirty Years' War began during the last two years of his reign.

31B. A Beaker and Cover (Reichs-adler Humpen), 17⅞ inches high to the top of the cover, on a tall base with a decorated edge which is folded from above. On the bowl is painted, in various colours in enamel, a crowned double-headed eagle bearing on its outstretched wings the escutcheons of the members of the ancient Germanic Federation, and on its breast the figure of Christ on the Cross. Above is the inscription : " Das Heilige Römische Reich mitt sampt seinen Bliedern 1645." Above the inscription is a gold band with single bands of white enamel dots above and beneath. The cover, surmounted by a finial, is decorated in gold, white, and red. (See note on No. 30A.) *1645.*

32A. A Pass-glas, 8¼ inches high, tapering from 2⅜ inches in diameter at the top to 1¾ inches at the bottom. Around the outside is a fine wheeled stringing that encircles the glass nine times. The base is 3¼ inches in diameter and is formed by pressing in the vessel at the bottom, thus making a high base which also forms a high cone inside the glass.

Late 16th or early 17th century.

The Pass-glas is a typical German form which was made chiefly during the 17th century. It is always cylindrical, and is decorated by a stringing which sometimes encircles the glass spirally and at other times forms a number of rings more or less equidistant from one another, the intervening zones occasionally being marked by numerals. The manner of its use is explained by the following doggerel that is to be read on a Pass-glas in the Museum in Vienna, from which we gather that the penalty due for failure to empty a division, as made by the " stringing " on the outside of the glass, was the obligation to drink the contents of another :—

> Vivat. In gesundheit vnsser aller Innsgemein
> Sollen die Päss aussgetruncken sein
> Wär aber seinen Pass nicht dressen Kan
> Der soll den andern gleich auch hahn
> Nun so will Ich sehen zu
> Dass Ich den Pass bescheidt auch thu
> Wie Es mein nachbar hadt gemacht
> Da hien will Ich auch sein bedach Vivat.

32B. A Pass-glas, 8⅝ inches high, tapering from 3¾ inches in diameter at the top to 3 inches immediately above the base. Three trailed wheeled rings are applied around the outside at equal distances. The base is 4¼ inches in diameter and is formed by flattening the vessel at the bottom, thus making a base which projects about ⅝ of an inch and which forms a slight cone inside the glass. *Late 16th or early 17th century.*

33A. A ROEMER, 3¾ inches high, of green glass shading to blue in places. The outside of the upper part of the bowl is painted "en grisaille" with mythological marine figures; the lower or cylindrical part is almost covered by four large flat smooth prunts. Around the junction of the upper and lower portions of the bowl is a very delicate plain stringed band. The spun base is short. The diameter of the top is 3¼ inches.

Late 16th or early 17th century.

Whilst the decoration on this glass may be ascribed with certainty to the second half of the 17th century, the glass itself may have been made as early as the preceding century.

Particular mention should be made of the "roemer," a form that is usually acknowledged not only to be the most beautiful product of the German industry but one of the most beautiful forms that has been made in glass in any country during any period. The origin of the word "roemer" cannot be ascribed with certainty. Garnier attributes it to the word Roman, in reference to certain forms of glass found in Roman tombs in the Rhine country; but Robert Schmidt is of the opinion that the most probable explanation of the word is to be found in the corruption of the Netherlands-Lower Rhine word "roemen," to boast, show off or praise.

This form of glass was made throughout the Rhine country, in the Netherlands as well as in Germany (it was made also in Sweden), for which reason it is difficult or impossible to ascribe any particular piece to either country, in the absence of definite data. The origin of the form, according to Schmidt, is to be found in the knobbed beakers (Warzenbecher) of the 15th century, but it was not until the beginning of the 16th century that "roemers" as such existed. The evolution of the "roemer" is of interest. On some of the knobbed beakers of the 15th century the drinking rim was broadened and curved. This rim was developed until it became such an important member that it was as large as the cylindrical part. At about the same time a foot was added which at first was quite insignificant, frequently being but a zigzag pinched band, but which soon grew to greater importance. It was spun with a single thread, spirally, around a wooden or iron centrepiece that was used as a mould. The earlier "roemers" of the 17th century have a relatively short foot consisting of two to six spirals, but as time went on the height of the foot was increased, at the expense of the lower or cylindrical part of the bowl. This lower part is always decorated with applied bosses or prunts, such as are to be seen on examples of glass made during the period of the Roman Empire. Some of these prunts are flat and smooth; others have a single sharp projection like a thorn (a Roman form); whilst others are impressed like berries, or very rarely with lions' masks. Some "roemers" were made of colourless glass whilst others vary in colour from pale to deep green. Some examples have covers.

33B. A Roemer, of green glass, 8 inches high. The upper part of the bowl is engraved, in diamond point, with the figure of a piper seated on a barrel, a male and a female peasant dancing, and vine leaves; the lower or cylindrical part of the bowl is enriched by "strawberry" prunts. At the junction of the upper and the lower parts of the bowl is an indented stringed band. The spun base is short.

A glass with a similar decoration in the Boymans Museum, Rotterdam, is signed M. van Gelder, 1656. *Second half 17th century.*

33C. A Roemer, of delicate green tint, 9 inches high. The lower or cylindrical part of the bowl is enriched by twelve prunts on which are heads of lions stamped in relief. At the junction of the upper and lower parts of the bowl is an indented stringed band. The spun base is short. Prunts with lions heads are extremely scarce. Schmidt records only one example. *Second half 17th century.*

34A. A Cylindrical Bottle, of dark blue glass, $8\frac{1}{4}$ inches high, with a short flanged neck tightly contracted $\frac{3}{4}$ of an inch from the top. The bottle is decorated in diamond-point engraving; around the shoulder is a conventional wreath; on the front is the word "RUDOLF : (?)" in a cartouche above the figure of an angel, with outstretched wings, holding a cross in a circle (the arms of a family of millers), above the date 1672. On the rest of the bottle are sprays of flowers and leaves and a bird.

South German. *1672.*

34B. A Roemer, of dark green glass, $6\frac{1}{4}$ inches high. At the junction of the upper and lower parts of the bowl a narrow band is applied. The lower or cylindrical part of the bowl is decorated with smooth prunts. The stringed foot is low. *Circa 1650.*

Roemers with smooth prunts are usually of earlier date than those on which the prunts are ornamented.

34C. A Goblet of brown glass, 6 inches high. The deep trumpet-shaped bowl, which is set directly upon a spun foot, is encircled by a narrow wheeled band. Above the band are three applied projections, on each of which is a glass ring (one missing). Around the base of the bowl is an applied calyx-like decoration. *Early 17th century.*

35A. A TANKARD OF "MILCH" GLASS, 7¼ inches high, with pewter cover and base. The body is decorated with three semi-heraldic roses painted in red, blue, black, and gold, with raised bosses in the centres, and the inscription "Beata Fischerin Anno Domini 1679" painted in black. *1679.*

"Milch" glass was made in imitation of porcelain. In 1737 a doctor named Kundmann published a recipe in *Rariora Naturæ et Artis* for the making of this glass from human bones which he stated he had received from Kunckel, the famous maker of ruby glass. Dillon refers to one of the glasses so made which is preserved in the Museum at Breslau on which he says there is a quaint inscription which invites one to offer a libation to those poor heathens for whom, after suffering both on the field of battle and in the furnace of the glass maker, the pains of hell are reserved. From which one judges that the bones from heathen tombs were used for this purpose. Glass was made in imitation of porcelain in many countries: in Venice at the beginning of the 16th century, in Germany and France towards the end of the 17th century, and in England at the end of the 18th century.

35B. A CUP OF "MILCH" GLASS, 2¾ inches high, on three opalescent bosses which are applied as feet. The bowl is decorated in sepia with a continuous landscape with figures. *Third quarter of 17th century.*

This glass was decorated by Johann Schäper, the founder of a school of grisaille painters of the middle of the 17th century which bears his name. In the Mühsam Collection in Vienna there is a glass signed by Schäper on which is a scene a part of which is almost identical with a part of the decoration on this glass.

Born at Harburg on the Elbe, Schäper settled at Nuremberg in 1640, where he died on February 3rd, 1670. *Third quarter of 17th century.*

36A. A TUMBLER, 2⅝ inches high, on which representations of the Last Supper and, on the reverse, a single fly are painted in black.

A "Schäper" glass. *Latter half 17th century.*

36B. A TUMBLER, 3½ inches high, on which a picture of armed men and trees is painted in sepia.

A "Schäper" glass. *Latter half 17th century.*

36c. A Tumbler, 2⅜ inches high, on which armorial bearings within a circle and a continuous landscape are painted in black.

Latter half 17th century.

This glass was decorated by Johann Schäper. Like No. 35b, a part of its decoration is almost identical with a part of the decoration on a glass painted and signed by him which is in the Mühsam Collection.

37 and 38. Two eight-sided Bottles, 7½ inches high, with flat bottoms. Upon the under sides of the bottoms, and on the rounded parts of the bodies immediately below the necks, are insects painted in black. On the body of one is depicted a scene representing Diana and Callisto in sepia and two reds, and a view of a town by a river in black. On the body of the other is a bacchanalian scene in black, light yellow, rose and rust reds, and a view of a town on the banks of a river with boats.

Second half 17th century.

Schmidt records a similar pair of bottles (*Das Glas*, p. 218) in the Berlin Collection.

39. A cylindrical Beaker with cover, 12⅝ inches to the top of the cover. Towards the top of the glass is a band of gold ⅝ of an inch wide edged with white enamelled dots. In the centre are armorial bearings in blue, white, red, yellow, green, brown, and black enamel, beneath the inscription " I.G.D.3.H.Z.S.I.C.V.B.C." in white enamel. Below in white is the date " 1683." On the reverse is a conventional spray of flowers enamelled in colours, on either side of which are conventional designs in gold with red and white dots and white scrolls. The edge of the flat base is decorated with white enamel. The cover is decorated with conventional designs similar to those on the body and is surmounted by a finial which is gilded in parts. *1683.*

The armorial bearings on this glass are those of Prince Johann Georg III of Anhalt-Dessau, who in 1679, with the help of a Venetian, Bernardo Marinetti, set up a glass furnace in Dessau which continued until 1686. The following explains the lettering on the glass :—

J(ohann) G(eorg) D(er) 3 H(erzog) Z(u) S(achsen) J(ulich) C(leve) V(nd) B(erg) C(hurfurst). Cleve was the birthplace of Anne of Cleve, and it is here that the legend of the " Knight of the Swan " is localized.

The Duchies of Julich, Cleve, and Berg bear a not unimportant part in history, for it was upon the death of John William, Duke of Cleve, in

1609, that a bone of contention appeared between Catholics and Protestants in relation to the succession. It was a matter in which all Europe had a profound interest. "The Duchies of Cleve, Berg and Julich and the Counties and Lordships of Mark, Ravensberg and Ravenstein formed a triangle, political and geographical, closely wedged between Catholicism and Protestantism, and between France, the United Provinces, Belgium and Germany. Should it fall into Catholic hands the Netherlands were lost, trampled upon in every corner, hedged in on all sides, with the House of Austria governing the Rhine, the Meuse and the Scheldt. . . . Should it fall into heretic hands, the States were vastly strengthened, the Archduke Albert (ruler of the Spanish Netherlands) isolated and cut off from the protection of Spain and of the Empire" (Motley, *Life and Death of John of Barnevelt,* Vol. I, p. 60).

40A. A JAR AND COVER, 8¼ inches high to the top of the cover. The jar is deeply carved with a bacchanalian scene of children with a goat, below which is a conventionally designed band ⅞ of an inch wide. The cover is decorated with a similar band, above which is a small and delicate band of grapes and grape leaves, and is surmounted by a knop in the shape of an acorn, the lower half of which is ornamented.

Latter part of 17th century.

This was engraved probably by Gottfried Spiller. A glass with a similar decoration by Martin Winter is illustrated (Plate 12, No. 2) in Robt. Schmidt's book on Brandenburg glasses. Martin Winter was born at Rabishau, to the north-west of Hirschberg, and died May 21st, 1702. Spiller was his pupil and surpassed him in workmanship. The date of his death is unknown but he was living in 1721.

40B. A FOURTEEN-SIDED TUMBLER, 4 inches high, profusely engraved with the wheel. Four scenes emblematic of the four elements—Fire, Earth, Water, and Air—are enclosed by wreaths composed of palm leaves with masks and swags of fruit and flowers, the whole covering the surface of the glass.

Bohemian. *Circa 1700.*

41A. A GOBLET, 11 inches high. The straight-sided bowl, 4 inches high, is above a double collar and a flat hollow knop which rests upon a stem composed of a glass ring 4 inches in diameter which has on the outside an applied indented band surmounted on either side by a small ball, and on the inside a monogram in glass which is connected with the ring at three points. Below the ring are three collars and a hollow knop above a round foot 5 inches in diameter which has the edge folded from above.

Perhaps Scandinavian. *Circa 1700.*

41B. A GREEN GOBLET, 6½ inches high to the rim. The bowl, 3½ inches high, is slightly waisted and broad at the base. It is decorated by four vertical indented narrow straps that spring from points about 1 inch from the bottom. Around the stem are two broad collars, each having four impressed projections. The slightly domed plain foot is 4¼ inches in diameter. From the centre of the inside of the bowl an upright stick of glass projects 1⅞ inches above the rim. A separate piece of glass, 7 inches high, has a hollow stem ¾ of an inch in diameter, surmounted by a hollow figure of a running deer, 4¾ inches long, with open mouth; when the hollow stem is placed over the stick in the bowl, liquid can be abstracted from the bowl by sucking the mouth of the deer. *Circa 1660.*

42A. A LIGHT BLUE-GREEN BARREL-SHAPED VESSEL WITH COVER, 15 inches high to the top of the cover. Around the top and the bottom are three indented trailed bands. On either side are three depressions about 1 inch deep and 1½ inches in diameter. The cover is surmounted by a finial.

Late 17th century.

The depressions on this and on similar glasses were made in order that the drinker might obtain a firm hold of the vessel by putting his fingers in them. Such depressions are to be seen on some Roman glasses.

42B. A WINE GLASS, 6⅛ inches high. The straight-sided bowl, 2½ inches high, has the lower part enriched by deep moulded fluting. The pedestal stem is hollow. The edge of the foot is folded from above.

17th century or early 18th century.

42C. A TUMBLER, 3 inches high, engraved with a continuous scene in which appears a crowned woman with a young child, a monkey, a female wolf or dog, and a ship. On the bottom of the base is a daisy-like decoration where the " pontel " mark has been ground away.

Second half of 17th century.

An early example of German engraving of the Nuremberg school (probably by H. W. Schmidt) depicting a story that the writer has been unable to trace.

43. A ruby red bottle, 11½ inches high to the top of the silver-gilt stopper. The fluted gourd-shaped body has a smooth horizontal shoulder, above which it tapers to the neck which is smooth and bulbous towards the top. Immediately below the junction of the body and the neck is a silver-gilt collar. Below the body is a short pedestal in the shape of a Doric capital. The broad moulded foot has the edge mounted in silver-gilt.

Made by Johann Kunckel. Potsdam. *Circa 1700.*

Johann Kunckel was a famous glass maker who at one time held office as alchemist at the Saxon Court. He was born in 1638 (or a little earlier) in Schleswig. At an early age, while in the service of the Elector of Saxony, he was engaged in the search for the philosopher's stone. In the course of his work he became deeply interested in glass making, and in particular in the colouring of ruby glass. In 1679 he published his *Arts Vitraria Experimentalis,* a work which Dillon describes as " merely a retranslation into German of Merret's edition of Neri with supplementary notes." (The book published [1612] by Antonio Neri, a Florentine priest, is considered to be the most important work on glass making that has ever appeared, when account is taken of its influence on the industry.)

After 1677 Kunckel worked for the Great Elector Frederick William, who settled him near Potsdam, where he made his famous discovery in regard to the making of ruby glass. He afterwards passed into the service of the King of Sweden, and died in Stockholm as Baron Lowenstjern in 1702.

44. A Cup and Cover, 16 inches high to the top of the cover. The domed cover is surmounted by a baluster-shaped finial and is decorated with wheel-engraved fruit and flower branches with diamond-point engraved tendrils. The bowl, which is 4 inches high, is straight sided and is wheel-engraved with a continuous landscape illustrating the four seasons. On a tree hangs a shield bearing the escutcheon of a count of Nuremberg. Below the bowl is a baluster stem with five double collars and two hollow knops, the lower being elongated. The foot is round, engraved with crossed branches and has the edge folded *from below.* On the foot is the signature " Killinger fe," written with the diamond.

First quarter 18th century.

Frederick Killinger is described by Schmidt as the last of the Nuremberg engravers of the school of Schwanhardt. Little is known of him, although a few fine examples of his work exist. He died in Nuremberg, August 24th, 1726.

45. Four rectangular Bottles, 5 inches high, with short round necks and flat bottoms. On the upper part of each is a double band of small white enamelled dots. The fronts are enamelled with the arms of Augustus II, Elector of Saxony and King of Poland, and the date 1719. Beneath the arms are the words, respectively :—

" Ess: Croc: Or:," " Sp: Anis:," " Sp: Lumbr:," " Sp: Mellis:"

One of the bottles (" Sp: Anis: ") is fitted with a metal top. *1719.*

Augustus II, also known as Frederick Augustus I, Elector of Saxony and King of Poland, was the second son of John Georg III of Saxony. He was born at Dresden May 12th, 1670. He succeeded his elder brother as Elector of Saxony in 1694, an office that he resigned after his defeat at Olasch in 1697. He became King of Poland in 1697, after the death of John Sobieski in the preceding year. He was dethroned by Charles XII of Sweden in 1706, when Stanislaus Leszczinski was crowned in his place. In 1709 he was proclaimed King for the second time. He died February 1st, 1733.

46a. A Goblet and Cover, 10⅜ inches high to the top of the cover, on a faceted pedestal stem and a plain round foot. The urn-shaped bowl is cut with vertical panels and ridging ; the cover forms a shallow box with a glass screw stopper, that terminates in a prism, that may have been used for spices to put in the wine. Silesian. *1730–1740.*

46b. A Cup and Cover, 13¼ inches high to the top of the cover. The bowl and cover are both cut into ten panels of formal pattern. The baluster stem is faceted and the flat round foot is cut conventionally. The knops in the stem and in the finial that surmounts the cover are enriched by the incorporation of red and powdered gold bands.

Bohemian. *Circa 1730.*

47a. A Cup and Cover, 14½ inches high to the top of the cover. The bowl is wheel-engraved on one side with a picture of a lion hunt, on the other with that of a bear hunt ; around the two scenes is scroll foliage. The stem is moulded and knopped ; the foot is engraved with a formal design and has the edge folded from above. The cover is engraved with a formal design. *First half 18th century.*

47b. A Cup and Cover, 12¼ inches high to the top of the cover. The straight-sided bowl is wheel-engraved with scrolls and two seated female figures; around the top is inscribed: "WEISHEIT UND VERSTANDT EIN EDLER SITZ . . . WIRDT ENTLICH VON DER LIEB ERHÜTZ"; the base and stem are faceted. The almost flat foot, 4½ inches in diameter, is wheel-engraved with scrolls and has the edge folded from above. The cover is engraved with scrolls and has a faceted finial.

Probably engraved by S. Schwartz. *Early 18th century.*

48. A CUP AND COVER, 11 inches high to the top of the cover. The bowl is faceted at the base and is finely wheel-engraved with the armorial bearings of Johann Philipp von Walderdorf, Kürfurst of Treves, 1756–1768. The finely engraved cover is lightly faceted towards the centre and is surmounted by a finial with three faceted knops. The stem has three faceted knops. The high foot is faceted at the top and has the edge folded from above. West German. *Circa 1760.*

49. A CUP AND COVER, of purple tint, 9 inches high to the top of the cover. The bowl is faceted and contracted at the base and is divided into three large and three small panels. The large panels are decorated with a wheel-engraved scene of a courtyard of a building with a fountain, a female figure, and a coat of arms. On each of the three small panels are fine scenes and arabesques. The cover is decorated with an engraved scene and arabesques, is faceted towards the centre, and is surmounted by a faceted finial. The pedestal stem is faceted. A German inscription is engraved on the plain round foot. Silesian. *Circa 1735.*

50. A CUP AND COVER, 9½ inches high to the top of the cover. The bowl of the cup is panelled and contracted at the base, the panels being very finely decorated with wheel-engraved arabesques containing fruits and scenes, the front panel showing a view of Hamburg, in front of which is suspended a Republican orb by a chain composed of links, opposite each of which is the name of one of the Virtues—"Mens," "Anima," "Pietas," "Sapientia," etc.—thirteen in all. On one side of this panel is the word "Felicitas" and on the other "Reipublicæ." The engraved cover is faceted towards the centre and is surmounted by a finial. The pedestal stem is faceted; the round foot has a finely engraved border. Silesian. *Circa 1735.*

51. A PAIR OF DECANTERS, 7⅞ inches high. On the bowls, which are contracted and faceted at the base, are polished and wheel-engraved

arabesques between three panels which respectively contain the arms of the Lambertini family, the figure of a Pope being crowned by a flying cherub and the figures of Faith, Hope, and Charity. Above and below the decoration on the bowls are plain gold bands. Around the longitudenally faceted necks are faceted collars. The feet are round with faceted edges, and are surmounted by single low collars. *Circa 1750.*

Pope Benedict XIV (1740–1758) belonged to a noble family of Bologna. Perhaps the most important act of his pontificate was the promulgation of his famous laws about missions, the consequence of which was that most of the so-called converts were lost to the Church. The two papal Bulls " Ex quo Singulari " and " Omnium Solicitudinum " denounced the custom of accommodating Christian words and usages to express heathen ideas and practices which had been done extensively by the Jesuits in Indian and in Chinese missions. Benedict XIV protected the Roman Coliseum from further demolition by consecrating the interior to the Passion of Christ, a reference to the frequency with which the blood of martyrs had flowed there.

52A. A CUP, 6⅛ inches high. The ten-sided bowl is very finely decorated with wheel-engraved scrolls and arabesques and is faceted at the base. The faceted baluster stem is above an engraved round foot.
Reisengeberge. *Early 18th century.*

52B. SIX SWEETMEAT GLASSES, 4½ inches high. Each bowl is oval with an irregular edge and has an overhanging scallop at the back. On either side are raised and polished scallops. The whole is finely wheel-engraved with minute scenes and scrolls. No two of the engraved decorations on the bowls are alike. Each has a panel at the front, containing respectively scenes with water and a boat, a coach and horses, a man with a guitar, a garden with fountains, a garden and lake, and three people seated at table playing a game. The bases of the bowls and the pedestal stems are faceted. The feet have slightly scalloped edges and are engraved with a formal design at the edge and with small polished facets on the under side.
Silesian. *Circa 1750.*

52C. A CUP, 4⅝ inches high. The base of the bowl is contracted and faceted; the upper part is divided into four panels. The two smaller panels are decorated with arabesques, engraved and polished. On one of the larger panels is a female figure riding on a snail above which are the words " Die Hoffnung besser Zeiten," and below " Wen komt Sie " ; on the other is a female figure bearing a cross in her hand with a female figure on either side, one bearing a cornucopia and a palm, the other bearing a sword and scales, above which are the words " Man fraget nach gutten leütten," and below " Wo sind sie." Below the bowl is a single flat faceted knop above a foot, finely engraved with interlaced scrolls and foliage, which has a faceted edge. *Circa 1750.*

53A. A SWEETMEAT GLASS, 4½ inches high. The irregular-shaped bowl is above a faceted pedestal stem on an octagonal foot. The bowl, stem, and foot are decorated with dark sepia touched with gold. The decoration on the bowl is of columns, fountains, and two views of a man and a woman in a garden.

Probably painted in Breslau. In the style of Daniel Preussler.

Circa 1720.

53B. A MANY-SIDED TUMBLER, 3 inches high, made of two sections of glass, one fitting accurately within the other. Gold leaf has been applied between the two sections on which a hunting scene has been engraved with a sharp instrument. The bottom is composed of two sections, the lower one of ruby glass, a gold flower being between the two sections.

Early 18th century.

(This glass was filled with ink for the purposes of photography.)

This method of enclosing gold leaf, decorated by means of a sharp instrument, between two sections of glass was first employed by the early Romans. It was a means of decoration frequently employed by the Germans during the first half of the 18th century.

GLASS OF THE LOW COUNTRIES

The designation "Low Countries" includes, for the purpose of this book, that part of Europe which now comprises Holland and Belgium. The glasses made there in early days were rude and coarse. In an inventory of 1379 of effects belonging to Charles V of France reference is made to a goblet and a ewer as being "voirres blants de Flandre," but it is possible that these pieces actually came from the East, for we know that in the 15th century large consignments of glass were made from Venice to Bruges and to Antwerp, some of which came from Damascus. There is no doubt that the better quality of glass was made in the Netherlands before the 16th century, but our first definite information about such glass is in regard to the setting up of a glass house in Antwerp in 1541 by a Venetian glass maker, Jean-Michael Cornachini (Schuermans and Pinchart, *Bulletin des commissions royales d'art et d'archéologie*, Brussels, 1881–1884). From that time onwards there were numerous Venetians making glass "façon de Venise" in various parts of the Low Countries. In Liége glass has been made since two glass makers from Lorraine, Jean and Nicolas Colnet, who received a concession from Charles the Bold on March 8th, 1468, established themselves at Fontaine l'Evêque about the middle of the 15th century. Perhaps in 1569, but certainly in 1571, "verres de Venise liègeois" were being made by Nicolas Francisci. During the 16th and 17th centuries Italian glass workers were established in many districts throughout the Netherlands, where all the processes known to the makers in Murano were practised. Muranese seem to have settled chiefly in Antwerp, and wanderers from L'Altare at Liége. These two were the most important centres and were in constant rivalry. Dr. Hudig (*Das Glas*) gives the following list of towns where superior glass was made, together with the periods during which the industry was maintained.

In the southern Netherlands:—

Antwerp.	1549–1629.
Liége.	1569–1611 and 1626 to the 18th century.
Brussels.	1623 to the 18th century.

In the northern Netherlands:—

Middleburg.	1581–1646.
Amsterdam.	1597–1679 or perhaps into the 18th century.
Rotterdam.	1614–1634 (?), 1641–1644 (?), 1669–1677, 1681–1696.

The Hague.	1632 (?)–1678, 1695 to the 18th century.
Maastricht.	1645 to the 18th century.
s'Hertogenbosch.	1656 to the 18th century.
Nimwegen.	1658–1670.
Haarlem.	1665–1667, 1679–1697.

During the latter half of the 17th century and during the 18th century the Netherlanders developed the art of engraving with the wheel and with the diamond, the latter to a degree of perfection that was reached in no other country. By the beginning of the 18th century Italian influences had been displaced largely by those from Bohemia.

After the English discovery of the process of making "glass of lead" many English glasses were imported and were engraved during the 18th century by the artists of the Netherlands, although some doubt exists as to whether all such glasses of fine quality were made in England. It is customary to attribute them to the English furnaces because of their quality and because we do not know that glasses of such excellent material were made elsewhere at that time, but the correctness of this supposition remains to be proved definitely. The majority of those that bear Dutch devices have knops in the stems that contain "air-beads" and seem, to the writer, to differ slightly in form from the traditional English glass of the same period. It is strange, if they are English, that nearly all glasses of this type bear Dutch arms or inscriptions, and that none of which the writer has knowledge bear English ones. In this book these glasses are described as "probably English."

54. A Mill-glass, 9¼ inches high, of glass and silver. The glass part is an inverted bowl, of leaden tint, 4 inches high surmounted by a finely fluted knop that shows traces of gilding. The bowl is decorated with diamond-point engraving. Above the rim are the words "CONCORDE EN VNITE," above which are four panels containing scrolls and leafage. Below the knop are alternate straight and wavy rays. Above the knop is a silver mill with sails and a stairway leading from the door, on which are three small silver figures—a man standing at the top, a figure of Cupid half-way down, and a second man ascending with a sack. A girl leans from the mill window. By blowing through a silver tube the sails and a hand on a clock dial are set in motion. The silver is Dutch and is contemporary with the glass with the exception of the sails which may have been made later. The decoration on the glass shows Venetian influence and is

similar to that on the Verzellini glasses dated 1580 and 1581 (Nos. 82 and 83) illustrated in the English section and the German cylindrical glass dated 1594 (No. 29). The glass itself appears to have been made by a Venetian in Venice or elsewhere. *Probably early 17th century.*

Hartshorne (*Old English Glasses*, p. 52) describes such glasses (Molenbecker), and adds: " To the silver mill at the lower end of the glass a pipe was attached: by blowing through it, after the glass was filled, the sails were set in motion and a hand marked up to 12 on a dial. The orthodox proceeding was to empty the glass as many times as the hand indicated on the dial when the sails stopped—doubtless a very popular game. But persons who flinched, and were not disposed to run the risk of twelve glasses ' deep as the rolling Zuider Zee ' were suffered to compound by emptying the beaker once before the sails stopped, also a thing not easy to do, but less hazardous."

55A. A GOBLET, 6 inches high, slightly tinted green. The lower part of the straight-sided bowl has twelve vertical raised ribs each terminated by a projecting point, above each of which is another projecting point. The stem has a hollow four-lobed knop. The edge of the plain round foot is folded from above. Liége. *First quarter 17th century.*

An example showing Venetian influence.

55B. A GOBLET, 6⅝ inches high. The bowl, 2¼ inches high, is impressed or moulded in a pineapple design. The slender stem is interrupted by two hollow knops and three collars, one immediately below the bowl. The edge of the round foot is folded from above. *Late 17th century.*

An example showing Venetian influence.

55C. A WINE GLASS, 10¼ inches high, with a straight-sided bowl, 3¼ inches high, above a collar. The stem is composed of three large hollow bulbs, each above a collar on a short section of solid stem. The foot is 4¼ inches in diameter, with a narrow edge folded from above. *Early 17th century.*

55D. A WINE GLASS, 8⅞ inches high, with a funnel-shaped bowl, 2⅝ inches high, on a stem composed of five elongated bulbs with collars between. The foot, 3⅞ inches in diameter, has a narrow edge folded from above. *Early 17th century.*

56. A GOBLET, 6¾ inches high, with a cylindrical bowl 3½ inches in diameter and 3⅜ inches deep, on which is engraved with a diamond a continuous scene. On one side is a crowned woman being led by a Cupid

above whom is an inscription " DE LIEFDE SIET GEEN LEIDT " (Love sees no grief), and on the other are two Cupids, trying vainly to strike fire on a steel and tinder, at whose feet lie a number of broken arrows and a broken bow, above whom is inscribed " Ic VER GHEEFS " (I, in vain). The stem is composed chiefly of a single delicate hollow knop. The plain foot is 3⅞ inches in diameter. *Circa 1655.*

57A. A " FLUTE " GLASS, 16⅝ inches high. The tall flute-shaped " bowl " is finely decorated with diamond-point engraving. On one side is a portrait of William II, Prince of Orange, and the inscription " Wilhelmus Prin d'Orange " set in a circle. On the opposite side is the trunk of an oak tree with a single branch. Around the top in large letters " Vive le Prince d'Orange " is inscribed. Below the bowl is one hollow knop, surmounted by a collar. The edge of the flat foot, which is 4¼ inches in diameter, is folded from above. *Circa 1645.*

William II, Prince of Orange, was born at The Hague May 27th, 1626. On May 2nd, 1648, he married Mary (who was born November 6th, 1631, and died December 24th, 1660), the eldest daughter of Charles I. He died on November 6th, 1650. Their only son, William Henry, Prince of Orange, afterwards became William III, Prince of Orange, and King William III of England.

The oak trunk and sapling was the device first adopted by Prince Maurice of Nassau. Motley (*The United Netherlands,* Vol. I, p. 14) writes in regard to Prince Maurice : " He assumed at once " (after the assassination of his father, William the Silent) " for his device a fallen oak, with a young sapling springing from its root. His motto, ' TANDEM FIT SURCULUS ARBOR ' (' The twig shall yet become a tree '), was to be nobly justified by his career."

This form of glass seems to have had its origin in the Netherlands, although the bulb at the base is Venetian.

57B. A GOBLET OR " FLUGEL " GLASS, 15½ inches high to the top of the cover. On the straight-sided bowl (3⅝ inches high), finely engraved with the diamond are the escutcheons of William III, Prince of Orange (King of England, 1689–1702), and those of four Netherlandish Provinces above an orange tree, and the date 1673 below that of the Prince. The cover, upon which are raised ribs ending in projections, is surmounted by a complicated finial with a hollow knop and trailed wing-like projections. The tall stem is composed of a tortuous strand of twisted clear and opaque white glass, at the edges of which are impressed projections of clear glass. The edge of the round foot, which is 4⅜ inches in diameter, is folded from above. *1673.*

This type of glass, called "Flugelgläser," "Winged glasses," or "Verres à Serpent," was made in the 16th and 17th centuries in Venice, also in Germany and in the Low Countries (large numbers were made in Liége, where Venetian workmen were employed). Those made in Venice seem to be more delicate than those made in the North.

58. A "FLUTE" GLASS, 16¼ inches high. The slender flute-shaped bowl is very finely decorated in diamond point, on one side with a portrait of William III, Prince of Orange, with the inscription "WILHELMUS III D.G. Princeps Aransionensium, Comitem Nassauie etc" in a medallion; on the other side with the escutcheon of the Prince. At the top of the bowl is an encircling garland. The rest of the bowl is decorated with sprigs of flowers and two birds. Below the bowl is a single short hollow knop. The round foot, decorated with two sprigs, has the edge folded from above. *Circa 1675.*

William III, Prince of Orange, the son of William II, Prince of Orange, and Mary, daughter of Charles I of England, was born at The Hague on November 14th, 1650. He was made Hereditary Stadtholder of Holland in 1672. On November 4th, 1677, he married Princess Mary, eldest daughter of James II of England. William and Mary were crowned King and Queen of England on April 11th, 1689. Queen Mary died on December 28th, 1694, and King William on March 8th, 1702.

59. A GLASS, 17¼ inches high. The bowl is in the shape of the hull of a ship, 11 inches in length, pointed towards the front, where there is a spout, and flattened at the back, to which is attached a handle surmounted by a hollow balloon-shaped projection. Openwork trellis springs from the top of each side of the bowl and joins 7 inches above it, where a "horn of plenty" rests, which is 4 inches long and 1½ inches high, and is encircled by a fine trailed band. Above the front of the bowl is openwork trellis 2 inches high. The base of the bowl is broadened and is surrounded by two slightly indented trailed bands between which are four raised prunts embossed with lion's heads alternating with four smaller ones with impressed "raspberry" design. Below the bowl is one large hollow fluted knop above a tall foot, 3 inches high, that has the edge folded from above. Probably made in Liége. *17th century.*

Such vessels were made of glass a century earlier by the Venetians, and of silver by the German silversmiths.

60A. A SALT CELLAR, 2⅞ inches high, composed of a bowl 2⅞ inches in diameter, that rests upon a hollow moulded base with round projecting corners which are supported by four heavy scroll feet.

Probably made in Liége. *End 17th century.*

60B. A JUG, 6½ inches high, tinted purple. The lower part is rounded and is covered by a large moulded latticed design. The plain upper part tapers slightly downwards from the top (which is 2¾ inches in diameter) and is enriched by a single trailed ring 1⅝ inches from the top. The handle, which is applied at the top against the ring, has a moulded groove throughout its length and is pinched in towards the top so as to form a projection ¾ of an inch long. The foot is a moulded denticulated ring.

Probably Netherlandish. *Circa 1665.*

60C. A CANDLESTICK, 9¾ inches high. The bobêche is moulded in small squares and is surrounded by one plain ring. The stem is composed of trailed glass with projections "façon de Venise"; the high foot is very delicately moulded and has an edge folded from above.

Probably made in Liége. *Early 18th century.*

61A. A BOTTLE OF GREEN GLASS, 10¼ inches high, bulbous in shape, with a tall neck and no handle. The body is decorated in diamond point, with a sentence in Dutch so written as to cover it with scrolls. At the base of the neck is engraved "Syrach cap: vers 31." Engraved under the base is: "Willem van Heemskerk in Leyden 1674. ÆT 61." *1674.*

Towards the top of the neck is a raised ring or collar to which was attached a metal mount to be connected by a chain with the stopper. A similar collar was to be seen on an ancient carafe that was in the castle of Saint Germain in 1873.

Willem Jacobsz Heemskerk was born in Leyden in 1613. He died in 1692. A number of glasses exist which he decorated with the diamond, always with script so ornamented with scrolls as almost to cover the glass. Many of these glasses bear, in addition to his signature, the date of his work and his age at the time. Frequently he added a philosophical sentence.

61B. A GREEN BOTTLE, 5½ inches high, bulbous in shape, with a tall neck. "Nuttenfonderkrassen" elaborated with scrolls is engraved with a diamond on the body. Towards the top of the long neck is a collar mounted with pewter, to which the pewter mount to the cork is attached by a chain. Under the body is engraved: "Willem van Heemskerk 11 Decemb. 1684." "Die van Sijn vangst veel schettert, krast en swest valt vaek de brok voor s . . . . er uit het nest." *1684.*

A free translation of the inscription on the base of the bottle reads: "He who swaggers brags and boasts much about his catch often lets it fall from the nest before he swallows it." The inscription around the body of the bottle may be translated: "Make use of me, but don't boast about it."

62A. A **Wine Glass**, $7\frac{7}{8}$ inches high. The straight-sided bowl is decorated in diamond-point engraving on one side with the Dutch lion holding a sword in his right hand and seven arrows, emblems of the Seven Provinces, in his left. On the rest of the bowl are the words "Salus Patriae," delicate sprigs of flowers and a flying bird. Beneath the bowl is a collar. On either side of the hollow stem, which is composed of a series of bulbs, is a delicate scroll. The foot is engraved with a wreath of foliage and flowers and has the edge folded from above. *Circa 1680.*

This glass was made and engraved in Holland and has a stem that is typically Venetian.

62B. A **cylindrical Glass**, $6\frac{1}{2}$ inches high and $3\frac{1}{2}$ inches in diameter, upon three small flattened ball feet. On it, engraved with a diamond, are a figure of a man leading a girl, and two dancing male figures below vine branches with leaves and grapes that encircle the glass. Signed "W. Mooleyser 1685." *1685.*

63. A **Goblet**, $8\frac{3}{4}$ inches high. The bowl is profusely decorated with fine wheel-engraving representing Bacchus astride a barrel, grapes, vine leaves, and birds. The base of the bowl is expanded and pinched diamond ways. The stem is composed of two four-lobed hollow knops with collars above and below. The foot is engraved with a conventional wreath of flowers and leaves and has the edge folded from above. *Late 17th century.*

This is one of the earliest examples of Dutch engraving with the wheel. It suffers from "sickness." Glass, like everything else, will pass away in time, but some glasses will last a shorter time than others, the length of their lives being dependent upon their composition. Otto von Falke in an American publication, *Antiques*, points out that glass is principally a combination of silicic acid, in the form of sand or flint, with one of the alkalis that promote melting, and that it is upon the correct combination of these and upon their working up that the health of the glass depends, although this combination is not free from chemical change. In this case the "sickness" is in its first stage, which is indicated by a network of minute cracks as fine as a spider's web. Johann Kunckel in his *Ars Vitraria Experimentalis* (1679) gives an express warning against the addition of too great a quantity of alkali in the composition of glass, because such glass "when exposed to the air, or even left to itself, soon crumbles away."

At the Rijks Museum in Amsterdam are a number of similar glasses from the same Dutch glass house, all of which are suffering from "sickness," some being in a more advanced state of decomposition.

64A. A GOBLET, 7½ inches high. The straight-sided bowl is engraved in diamond point, on one side with the figure of a rampant lion, within a ring fence, that holds a sword in his right hand and seven arrows in the left hand. On the other side is a female figure holding in her right hand a staff on which is a cap, and in the other a spray of palm. Between the figures are sprays of flowers and birds. The bowl rests on a single hollow knop between two collars above a short stem. The foot is engraved with sprays of flowers and has the edge folded from above.

Latter quarter 17th century.

The lion is emblematic of the Netherlands; the seven arrows are emblematic of the Seven Provinces. The female figure on the reverse is Holland holding on her staff the cap of freedom. The surrounding fence denotes Security.

64B. A GOBLET, 8½ inches high, with a straight-sided bowl decorated with diamond-point engraving. On one side are the armorial bearings of King William III of England, with those borne by him as Prince of Orange in an escutcheon of pretence. On the other side are the words "God bles the Kingh." Beneath the bowl is a single hollow knop between two collars. The foot is engraved with four conventional flowers and leaves and has the edge folded from above. *Late 17th century.*

This glass must have been made between 1689 and 1702 during the reign of William III as King of England.

65A. A BOTTLE OF BLUE GLASS, 9 inches high, with a hollow handle and a silver-gilt top with collar and chain. The body is profusely decorated in diamond point with grape vine and leaves and a peacock; the neck is decorated with sprays of leaves and flowers. *End of 17th century.*

65B. Two Wine Glasses, 8 inches high. The funnel-shaped bowls are drawn into continuous delicate stems. The plain round feet are slightly convex. *Early 18th century.*

Sometimes considered to be English, but in the opinion of the writer probably Dutch. Perhaps similar ones were made in both countries.

66A. A Benitier, 11½ inches high. The lower part of the pointed back is composed of a tortuous twisted strand of clear glass in which is a clear blue riband; the upper part is a flat corrugated section of glass. Around the back is applied a broad, flattened, uneven border of irregular width with an impressed scollop edge. The conical fluted bowl, 3⅜ inches deep, is moulded into three rounded steps and has at its base a fluted knop. The bowl is attached, at the top, to the base of the back; in the centre by a compressed collar, and at either side by a strut with an impressed outer edge. *18th century.*

Many Benitiers were made under Venetian influence in Liége during the early part of the 18th century.

66B. A Barometer, 11 inches high, tinted in two shades of blue. The rounded body, flattened at the back, tapers upwards and is decorated with four applied and impressed vertical projecting bands that extend two-thirds of the length upwards from near the base, below which is a projecting knop. A vertical spout, decorated by an applied band, springs from the front near the base and is 5¼ inches high. At the top is a decorated ring 2 inches in diameter. Below the ring is an applied decoration resembling the head and wings of a bird. Made in Liége. *Early 18th century.*

Similar barometers were made in England. When filled with water, the expansion or contraction dependent upon the pressure of the atmosphere can be noted in the vertical spout.

67. A Glass, 8¼ inches high, with a drawn trumpet-shaped bowl on a plain stem. The round foot has an edge folded from above. The bowl is engraved in diamond point with grotesque figures, and is signed "Frans Greenwood pinxit 19 Jan. 1720." English. *1720.*

The earliest recorded dated example of Greenwood's work, and the only recorded one engraved with lines.

Frans Greenwood was born in Rotterdam in 1680; subsequently he worked in the Municipal Office at Dordrecht and died in 1761 or 1762. The figures on this glass were copied by Greenwood, with minor alterations, from figures in the series of engravings "Balli di Sfessania" by Jacques Callot, which probably were engraved in 1629. The two figures on either side of a bottle which is on the ground, are those of Cap. Zerbino and Scarpino; the man with the pole is Mamarao, and the fourth is Smaraola cornuto.

Jacques Callot was born in Nancy in 1592. He inherited artistic tendencies from his mother's family and became a famous engraver, his work having a marked effect upon the art of engraving. In 1614 he entered the service of Cosmo de Medici in Florence, upon whose death on February 28th, 1621, he returned to Nancy at the wish of Prince Charles of Lorraine. When Louis XIII entered Nancy, after its capture by Richelieu's troops on August 26th, 1633, he sent for Callot and bade him make an engraving commemorating the siege of Nancy, as he had similarly commemorated the siege of Rochelle. Callot refused, saying that he would do nothing to the dishonour of his Prince. Louis accepted his excuses, adding that Charles of Lorraine was fortunate in having so faithful a subject. Instead, on the following day, Callot executed his " Misères de la guerre," representing his country desolated and ruined by the troops of Richelieu. He died at Nancy on March 25th, 1635.

68. A GOBLET, 8½ inches high. On the bell-shaped bowl is stippled with a diamond a portrait of a man holding in his left hand a roemer to which he points with his right hand; behind him is the bough of a tree. Beneath the picture is the signature " F. Greenwood fecit 1728." Below the baluster stem is a domed foot with the edge folded from above.

Probably English. *1728.*

69A. A WINE GLASS, 7¼ inches high, with a straight-sided bowl finely wheel-engraved on one side with the arms of Rotterdam, on the other with other armorial bearings. Beneath the bowl is a collar above a ribbed and moulded pedestal stem above a domed and moulded foot.

Perhaps Liége, perhaps English. *18th century.*

69B. A GOBLET, 8 inches high, with a straight-sided bowl, on a baluster stem with an " air tear " in a central swelling knop, above a round foot with the edge folded from above. The bowl is decorated with a wheel-engraved spray of rose leaves, flowers, and buds, beneath which is inscribed " Nulle Roose sans Epine." The base of the bowl is thick.

Perhaps Liége. *Circa 1740.*

70A. A GOBLET, 7¾ inches high, with a straight-sided bowl on a baluster stem with four knops, in one of which are " air beads," on a plain round foot. The bowl is finely wheel-engraved with the arms of William IV of Orange. Probably English. *Circa 1734.*

Prince William Charles Henry Frisco was born at Leeuwarden on September 1st, 1711. He married Anne, daughter of George II, on March 14th, 1734. He was proclaimed Stadtholder, Captain and Admiral-General of Zealand at Terveer in 1747 under the title of William IV, and shortly afterwards a similar position in regard to all of the Seven Provinces was bestowed upon him; a little later these offices were declared hereditary in both male and female lines. He died at The Hague October 22nd, 1751.

70B. A GOBLET, 8¼ inches high, with a straight-sided bowl on a baluster stem, in the upper half of which are two knops in which are "air beads"; in the lower half is a "tear." It has a plain round foot. The bowl is finely wheel-engraved with the arms of Anne, daughter of George II, who married William IV, Prince of Orange. Probably English. *Circa 1734.*

Anne, Princess Royal, daughter of George II, was born at Herrenhausen in 1709 and was married to Prince William Charles Henry Frisco, afterwards known as William IV, Prince of Orange, on March 14th, 1734, in the French chapel adjoining St. James's Palace. After the death of her husband in 1751 she governed the Dutch Republic during the minority of her son, William V, Prince of Orange, until her death on January 12th, 1759.

70C. A GOBLET, 9¾ inches high, with a straight-sided bowl on a baluster stem with an "air beaded" centre section, on a plain round foot. The bowl is finely wheel-engraved with the arms of Anne, daughter of George II, and those of William IV, Prince of Orange, supported by a female figure seated at the foot of an orange tree, all within a ring fence, the whole surrounded by the arms of the Seven Provinces. Around the top is inscribed "HOLLANDS BEEDE IS RUST AN VREEDE."

Probably English. *Circa 1734.*

The arms of the Seven Provinces shown are those of Holland, Zealand, Friesland, Guelderland, Utrecht, Overyssel, and Groningen. The seated figure represents Holland holding a staff and cap, emblems of Freedom. The fence is emblematic of Security.

71. A "HOGARTH" GLASS, 7 inches high, with a large, waisted, bell-shaped bowl which is decorated with a portrait of William IV, Prince of Orange, on a catafalque, weeping figures, etc., in fine stipple engraving. Above, in a ribbon, are the words "HEU PACIS OCCIDIT AUCTOR." At the bottom is the signature of the engraver, "A. Schouman. Fec = 1752."

Immediately below the bowl, which is 5 inches high, is a single knop with "air beads," which rests on a plain round foot 4½ inches in diameter.

Probably English. *1752.*

A. Schouman was born in Dordrecht in 1720 (? 1710). He died at The Hague in 1792. Robert Schmidt (*Die Gläser der Sammlung Mühsam*) records three signed examples of his work, two of which are in the Nederlandsch Museum, Amsterdam, and the third in the Municipal Museum at The Hague. William IV, Prince of Orange, died in 1751.

72. A GOBLET, 8¼ inches high, with a straight-sided bowl on a baluster stem with an "air beaded" knop at the top, on a plain round foot. The bowl is engraved with fine line and stipple diamond point, the subject being a portrait of a man lifting his hat with one hand and holding a roemer in the other, surrounded by a frame terminating at the top in vine leaves and tendrils. On the under side of the foot is the signature of the engraver, "J.V.D. Blyk fecit 1756," in diamond point.

Probably English. *1756.* (*The date on this glass may be 1786.*)

Signed examples by J. van den Blyk are at the Vielle Boucherie, Antwerp, at the Boymans Museum, Rotterdam, and at the Rijks Museum, Amsterdam.

73. A GOBLET, 8¼ inches high. On the straight-sided bowl, finely wheel-engraved, are an emblem of friendship and three scenes from the story of David and Jonathan. The first represents David and Jonathan making a covenant (1 Samuel xviii. 3); the second, Saul and Abner seated at table with Jonathan standing (verse 25); and the third, Jonathan shooting arrows beyond David to apprise the latter of Saul's anger (verse 36). Between and surrounding the scenes are pillars and scrolls. Beneath the scenes is the inscription "Quæ amat in præsentia succurrit in egentia," and above are "Vivat amicitia," "Defendit in absentia."

Probably English. *Circa 1740.*

74A. A GOBLET, 7⅞ inches high. On the straight-sided bowl the arms of Briel and the words "LIBERTATIS PRIMITIÆ" are wheel-engraved inside a circle. On the reverse is engraved "I. ROEST." The upper part of the baluster stem contains "air threads"; the knop at the top of the lower part contains elongated "air beads." The round foot is plain.

Probably English. *Circa 1755.*

Briel (Brielle or Bril) is a seaport town in the province of South Holland near the mouth of the Maese, fourteen miles west of Rotterdam. Admiral Van Tromp was born there. It is remarkable in history as being the first place captured in the struggle for Dutch independence from the Spaniards. It was taken in 1572 by the " Sea Beggars " under William de la Marck, William de Blois (Seigneur of Treslong), Adam van Haren, Brand, and other distinguished seamen.

74B. A GOBLET, $7\frac{3}{4}$ inches high, with a straight-sided bowl on a baluster stem with " air beads " in the central knop, on a plain round foot. Upon the bowl is wheel-engraved an allegorical figure subject with baskets of fruit and scrolls, above which is inscribed on a ribbon " VRIENSCHAP EN LIEFDE."

Probably engraved by Jacob Sang. Probably English. *Circa 1760.*

74C. A GOBLET, $7\frac{1}{2}$ inches high, with a straight-sided bowl upon which are engraved the arms of The Hague, on a baluster stem with " air beads " and embryo " air threads " extending from a knop to the lower portion, above a plain round foot.

Probably engraved by Jacob Sang. Probably English. *Circa 1750.*

75. A PAIR OF HOGARTH SHAPED CUPS AND COVERS, $8\frac{1}{2}$ inches high to the top of the covers. The waisted bell-shaped bowls are very finely wheel-engraved. At the top of each there are borders of scrolls, flowers, and birds. On one is depicted a new-born babe above a fine scroll decoration with the following on the reverse : " HET WELSYN VAN DE JONG GEBOORENE." On the other is a continuous picture showing a young mother in bed, a cradle being rocked by a nurse, and a table set with a pair of glasses similar to this pair. Above the picture is engraved " HET WELVAAREN VAN DE KRAAMVROUW." The borders of the covers are enriched by a fine design of grape leaves and fruits ; the tops are surmounted by pointed knops with " air tears." Beneath the bowls are single knops with " air tears " above plain round feet, $3\frac{1}{2}$ inches in diameter, on each of which is engraved " Jacob Sang. inv = et Fec = Amsterdam 1762." *1762.*

There is a custom in Holland that upon the birth of a child the intimate friends of the parents should, on a certain day, visit the home and drink from separate cups the health of the mother and of the new-born child. On these glasses are engraved scenes connected with this ceremony, including a table on which are the glasses from which the healths are drunk.

Jacob Sang was a German who lived and worked in Amsterdam at least during the years 1752–1762.

76A. A WINE GLASS, 7 inches high, with a straight-sided bowl which is finely wheel-engraved with a scroll decoration surrounding two love birds on a round perch, above which are the words " ONS LANG LEEVEN." In the central knop of the baluster stem are "tear threads." On the plain round foot is engraved "J. Sang, inv: et: Fec: 1758." Probably English. *1758.*

76B. A WINE GLASS, 7¾ inches high, with a bell-shaped bowl on which are engraved with the diamond the words "Studia et Artes" enclosed by long scrolls flowing from the letter "s." The central portion of the baluster stem contains elongated "air tears." On the plain round foot is engraved "Lokhorst Scrip. 1765." Probably English. *1765.*

76C. A WINE GLASS, 6⅞ inches high, with a straight-sided bowl on one side of which are wheel-engraved two clasped hands above two entwined hearts on an altar, in a medallion surrounded with scrolls and surmounted by a crown, and on the reverse: "DE HUWELYKS BANDT, BINDT HART EN HANDT." The baluster-shaped stem is cut and faceted. On the hexagonal foot is engraved "Jacob Sang, inv = et Fec = Amsterdam 1761." (Slight crack at top of bowl; the stem has been neatly mended.)

Probably English. *1761.*

77A. A WINE GLASS, 5⅜ inches high, with a straight-sided bowl, on a drawn cut and faceted stem, on a round foot. On the bowl portrait busts of William V, Prince of Orange, and his wife Frederica Wilhelmina, are finely engraved, in stipple, with a diamond point. English. *Circa 1767.*

William V, Prince of Orange, was born on March 8th, 1748. He was the son of William IV of Orange and his wife Anne, daughter of George II. William V married Frederica Wilhelmina, the niece of Frederick the Great, on October 4th, 1767. He was declared of age and assumed the power of Government in 1766. Upon the occupation of Amsterdam by the French Army under Pichegru in 1795 he fled to England and died in 1806.

This glass was engraved by D. Wolff of Utrecht, who lived as a painter at The Hague and died in 1809. Wolff's name has been used, as a generic term, in connection with the class of glass decorated with fine stippled diamond-point engraving, an art of which he was complete master.

77B. A WINE GLASS, 7 inches high, with a straight-sided bowl, on a cut and faceted stem with a cut and faceted knop, above a plain round foot. The bowl is decorated with the armorial bearings of William V, Prince of Orange, in fine stipple diamond-point engraving.

English or Netherlandish. *Circa 1767.*

77C. A GOBLET, 8⅜ inches high, with a straight-sided bowl which is very finely decorated in diamond-point stipple with the arms of William V, Prince of Orange, and those of his wife Frederica Wilhelmina, supported by two crowned lions amongst rocks and leafage. The faceted stem is on a plain round foot. Probably English. *Circa 1767.*

78a. A Goblet, $7\frac{1}{4}$ inches high, with a straight-sided bowl, on a baluster stem having in its centre a knop with "air beads," above a plain round foot. The bowl is decorated with a fine stipple diamond-point engraving of two young boys clasping hands. Above, in a ribbon scroll, is the word "VRIENDSCHAP." Probably English. *Latter half 18th century.*

78b. A Wine Glass, $6\frac{7}{8}$ inches high, with a straight-sided bowl on a cut and faceted stem with a cut and faceted knop, above a plain round foot. The bowl is decorated in very fine stipple diamond point with figures of two Cupids on clouds, one holding a small bunch of flowers, the other a cap on the end of a staff. *Latter half 18th century.*

English or Netherlandish. The staff and cap are emblems of Freedom. Probably engraved by Wolff.

79. A Goblet, $7\frac{3}{8}$ inches high. On the straight-sided bowl a portrait of a man with his chin resting on his right hand is engraved with a diamond, chiefly in stipple, but with a few lines. On the reverse are the initials of the engraver, G. H. H. (G. H. Hoolaart). The stem contains opaque white spirals. The round foot is plain. English. *Circa 1775.*

G. H. Hoolaart was a relative of the wife of Frans Greenwood, perhaps her nephew.

80. A Goblet, $8\frac{3}{8}$ inches high. The slightly waisted bell-shaped bowl is very finely wheel-engraved with a continuous scene of ships, small boats, whales and icebergs below the inscription "VAN D: GROENLANDSE EN STRAAT DAVISE VISSERY." The baluster stem has "air threads" in the upper section, and two "air beads" in the lower section. The plain foot is round. Probably English. *Circa 1770.*

81. A Goblet, $8\frac{1}{4}$ inches high, with a straight-sided bowl which is decorated with a very finely wheel-engraved view of a naval battle. Towards the top of one side of the bowl is inscribed "DE SLAG VAN DOGGERSBANK 17 $\frac{8}{5}$ 81." The stem is composed of three knops above and one below a pedestal. The top knop has "air beads," the second is clear, and the third has opaque white threads which pass spirally to the bottom of the knop below the pedestal. The foot is plain and round. Probably English. *Circa 1781.*

An indecisive but not inglorious naval action was fought August 5th, 1781, off the Doggerbank between the Dutch under Zoutman and the British under Admiral Parker.

ENGLISH GLASS

There have been glass furnaces in England in country districts where wood was easily available ever since the Roman occupation, but such glass as was made was simple and of poor quality. At the beginning of the reign of Queen Elizabeth the chief centre was along the adjoining borders of Sussex and Surrey. During the middle of the 16th century unsuccessful attempts were made by Frenchmen and by Venetians to maintain glass works in England where a better class of glass than that formerly made should be produced; but it was not until Jacob Verzellini received his patent in 1575 from Queen Elizabeth and set up his furnaces in the Crutched Friars in London that success was achieved. During the 17th century the industry was fostered by such prominent men as the Duke of Buckingham and Sir Robert Mansell; but so late as 1670 a large part of the glass used by the upper classes was imported from Venice, a single London dealer, John Greene, importing as many as two thousand dozen glasses during the period between 1667 and 1672. Upon the discovery in England, probably by George Ravenscroft in or about 1677, of the making of flint glass or glass of lead, English glass makers for the first time made a real contribution to the world's knowledge of glass making and to its development as an art. From that time onwards England became an exporter rather than an importer of glass; but the beauty of English glass from the end of the 17th century has been in respect of the metal used rather than its decoration.

82. A Goblet, 5⅛ inches high, slightly tinted brown, with a wide shallow bowl, on a single fluted hollow bulb, above a high conical foot, the edge of which is folded from above. The bowl is decorated with a design in diamond-point engraving consisting of three panels, in two of which are the initials "A.F.," and in the third "1580," with the intervening spaces decorated with scrolls and leafage and borders above and below the panels. The bowl broken and mended. *1580.*

Attributed to Giacomo Verzellini (Bernard Rackham, *Burlington Magazine*, October, 1913). Giacomo Verzellini was a Venetian who came to England and obtained from Queen Elizabeth on December 15th, 1575, a patent for twenty-one years "for the makynge of drynkynge glasses suche as be accustomablie made in the towne of Morano and hathe undertaken to teache and bringe vppe in the said Arte and knowledge of makinge the said drynkynge glasses oure natural Subjectes." The glasses were to be made "as good cheape or rather better cheape than the drynkynge glasses comonlye broughte from the cittie of Morano or other partes of beyond the Seas." Verzellini set up a glass furnace in the Crutched Friars in Hart Street, Aldgate, in the autumn of 1575 or (according to Hartshorne) made use of a furnace that had been used there by eight Venetians in 1549. Verzellini became naturalized on November 26th, 1576, and died at the age of eighty-four on January 20th, 1606, his remains being buried at Downe in Kent. Stow (1525–1605) in his *Chronicles* states: "The first making of Venise glasses in England began at the Crotched Friars, about the beginning of the reign of Q. Elizabeth, by one Jacob Vessaline an Italian."

This, the earliest recorded dated example of glass made in England, was sold at Christie's in 1891 in the collection of Mr. Edward Hailstone, of Walton Hall. In the sale catalogue it was stated to have been a present from Lady Georgina Smythe to Horace Walpole. It was included in the sale of Horace Walpole's effects at Strawberry Hill.

Four glasses are recorded which are attributed to Verzellini—a goblet dated 1586 in the British Museum (damaged), another dated 1583 (damaged) in the possession of Mr. Hamilton Clements, and the two glasses here illustrated, dated respectively 1581 (perfect) and 1580 (damaged).

83. A Goblet, 8¼ inches high, slightly tinted green, with a straight-sided bowl above a large fluted bulb which is between two small compressed ones, on a plain round foot with diamond-point engraved leafage. The bowl is decorated with a design in diamond-point engraving. On the upper part are a stag, a unicorn, and two hounds, each separated by a tree; the lower part is divided into three panels: the words "John . . . Jone" are in one, "Dier 1581" in the second, and the Royal Arms (of Queen Elizabeth) are in the third. Between the panels are scrolls and leafage; above and below are borders. The borders, scrolls, and panels are similar to those on the 1580 goblet (No. 82). *1581.*

Attributed to Giacomo Verzellini (Bernard Rackham, *Burlington Magazine*, October, 1913). This is the second earliest recorded dated example of glass made in England and the only undamaged example attributed to Verzellini. The question arises whether the glass commemorates John Jone (perhaps a curtailment of Jones), who by profession was a dyer, or John and Jone (Joan) Dyer.

84. A Bowl, 10¼ inches in diameter, impressed on the under side with a raven's head, the seal of Ravenscroft, the maker. The under side is moulded into radiating fluting interrupted by an applied foot rim.

1676 or 1677.

George Ravenscroft learned the art of glass making from Seignior De Costa of Montferrat, who was associated with him when he began to make glass. He set up a glass house in the Savoy (London) in 1673. In May of that year he obtained a seven years' patent for making " cristall for drinking glasses," and soon after he set up a glass house at Henley on Thames, the existence of which is mentioned in April, 1676, by Dr. Robert Plot. On June 3rd, 1676, the following certificate was issued by Hawley Bishopp and Samuel Moore, both agents of the Glass Sellers Company: " We do certify that the defect of the flint glasses (which were formerly observed to crissel and decay) hath been redressed several months ago, and the glasses since made have all proved durable and lasting as any glasses whatsoever. Moreover that the usual trials wherewith the essay of glasses are made have been often reiterated on these new flint glasses with entire success and easy to be done again by anybody, which proofs the former glass would not undergo, besides the distinction of sound discernable by any person whatsoever." On October 5th, 1676, an advertisement was put in the *London Gazette* much to the same effect, but adding " and for further assurance a Seal or Mark hath lately been set on them for distinguishing them from the former fabric and shall be continued." On May 29th, 1677, Ravenscroft made a further agreement with the Glass Sellers Company, which recites that he " has now brought the work to better perfection," and a list of articles and their prices is set forth, and a stipulation made that a Raven's Head shall be made or set in all the glasses " to distinguish the same from all others that shall be made in resemblance of the said glasses." Mr. Francis Buckley, from whose *Old English Glass* the above extracts are copied, concludes " that Ravenscroft invented the English flint glass (or glass of lead as applied to table ware) and that he made it probably before 1678, at which date his agreement to mark all his glasses in this way expired." Mr. Buckley adds that the invention was attributed to Ravenscroft by John Houghton writing in the year 1696.

Only six of Ravenscroft's glasses marked with a Raven's Head are recorded —a small tankard in the Victoria and Albert Museum, a large-handled jug and a bowl in the collection of Mr. C. Kirkby Mason, a decanter in the British Museum, a wine glass or goblet recently acquired by the author, and this bowl.

SEAL (a Raven's Head) of Ravenscroft on preceding glass.

85A. A GOBLET, 7⅞ inches high. The cup-shaped bowl is 4 inches high and has the lower part moulded into raised fluting. The hollow stem is

nearly cylindrical and is enriched by six raised " raspberry " prunts. At the junction of the stem and bowl is a narrow irregular trailed collar. The round foot, 3$\frac{3}{16}$ inches in diameter, has an edge folded from above.
Last quarter 17th century.

The shape of the bowl shows Venetian influence. The prunts, or nuppen, as they are called in Germany, are German developments of the 14th century having their origin in the projecting bosses on early Roman cups.

85B. A **Cordial Glass**, 5$\frac{1}{8}$ inches high, with a straight-sided bowl which is thick at the base and contains a " tear," on a baluster stem formed like an inverted acorn, above a round foot with the edge folded from above. The edge of the bowl is engraved in diamond point with scrolls, below which are the words " Take a dram Old Boy." *Late 17th century.*

The origin of Baluster Stems. Mr. Francis Buckley (*Old English Glasses*, p. 70) writes that " nearly all the baluster stems of ordinary English glasses will be found to be copies, or copies with variations, of one of three Venetian stems. The first was the urn shaped stem " (No. 86A). " This kind of stem could, of course, be varied in almost endless ways, the most noticeable of them perhaps being the ' inverted acorn ' " (No. 85B). " The second, the true baluster stem " (No. 88E), " was copied directly from Venetian glasses. Here the glass has a collar or scrolling below the bowl, then a long pear-shaped moulding which rests on a small knop or short length of straight stem. This shape is the one to which the name ' baluster ' was originally and properly applied. It is, of course, a Greek word having reference to the flower of the wild pomegranate." . . . " The third kind of Venice stem that found favour with our glass-makers was one composed of a series of knops " (No. 87A, Venetian prototype No. 20B).

85C. A **Goblet**, 7 inches high. The straight-sided bowl has a thick base below which is a double collar. The baluster stem is hollow ; its upper part contains a silver William III twopenny piece dated 1701. The round foot has the edge folded from above. *Circa 1701.*

86A. A **Goblet**, 10$\frac{1}{2}$ inches high, with a drawn funnel-shaped bowl on a baluster stem composed of a single knop with a " tear," above a round foot with the edge folded from above. At the top of the bowl " God bless Queen Ann " is engraved with a diamond. *Probably 1702.*

Probably made at the time of the Coronation of Queen Anne, 1702.

Queen Anne was born February 6th, 1665. She married July 28th, 1683, George, Prince of Denmark, was crowned April 23rd, 1702, and died August 1st, 1714.

86B. A circular sweetmeat Dish and Cover, $7\frac{7}{8}$ inches high to the top of the cover and $5\frac{7}{8}$ inches in diameter. The bowl, "double ogee" in form, is slightly moulded into eight panels and rests on a small domed and lightly moulded foot. Around the bowl is a flange upon which the cover rests. The cover when inverted is similar in form to the bowl and is surmounted by a finial which contains "air beads." *Early 18th century.*

87A. A pair of Chalices, 14 inches high, with straight-sided bowls on triple-knopped stems on round feet. *Early 18th century.*

Formerly used in the Moravian Church at Kilwarline, near Hillsborough, County Down, Ireland.

87B. A Wine Glass, $5\frac{3}{8}$ inches high. The straight-sided bowl is thick at the base and contains an "air tear." At the top of the baluster stem is a broad triple collar below which is an elongated "air tear." The round foot has the edge folded from above. *Circa 1710.*

87C. A Goblet, $8\frac{3}{4}$ inches high. The straight-sided bowl has a triple-cluster collar at the base, below which is a hollow bulb, with four applied "strawberry" bosses, containing a Queen Anne sixpence dated 1711. Beneath the bulb is a second triple-cluster collar. The swelling knop at the top of the baluster stem contains an "air tear." The round foot has the edge folded from above. *Circa 1711.*

88A. A Goblet, $8\frac{5}{8}$ inches high. The straight-sided bowl has a thick base. The large knop in the baluster stem contains a small "air bead." The edge of the round foot is folded from above. *Circa 1710.*

88B. A Goblet, 8 inches high, with a bell-shaped bowl. The upper member of the baluster stem is triple moulded; the lower member contains an elongated air bubble. The edge of the domed foot is folded from above. *Circa 1715.*

88C. A Wine Glass, $6\frac{3}{8}$ inches high. The drawn trumpet-shaped bowl has a thick base and rests upon a baluster stem the centre of which is in the form of a slightly tapering cylindrical column. The domed foot has the edge folded from above. *Circa 1715.*

88D. A Wine Glass, 6½ inches high. The waisted bell-shaped bowl is above a baluster stem of which the upper member is a triple-cluster collar. The round foot has the edge folded from above. *Circa 1725.*

88E. A Wine Glass, 7 inches high. The deep base of the trumpet-shaped bowl contains an "air bead." The baluster stem, composed of a pear-shaped moulding above a small knop above the base, is surmounted by a triple collar. The conical foot has the edge folded from above. *Early 18th century.*

88F. A Sweetmeat Cup, 5⅞ inches high. The double "ogee" bowl is wide and has a lipped rim. At the top of the baluster stem is a triple knop below a fine collar. The domed foot has the edge folded from above. *Early 18th century.*

89. An eight-sided Plate of glass, 5⅞ × 5⅛ inches, decorated with a portrait of King George I surmounted by the Royal Arms, engraved with a diamond point. *Circa 1714.*

George I was born at Osnabruck May 28th, 1660. He married, November 21st, 1682, Sophia Dorothy, daughter of George William, Duke of Zelle. He was crowned October 20th, 1714, and died June 11th, 1727.

90. A Goblet, 7¾ inches high, with a drawn funnel-shaped bowl with a plain stem containing an elongated "air tear," above a plain round foot. The bowl is finely engraved with a diamond point. At the top and the bottom are borders of interlaced delicate scrolls. On the front is the crowned cypher of the letters "J. R." above the word "Amen," and the following verse of the Jacobite hymn:—

"God Save The King I pray
God Bliss The King I pray
God Save The King;
Send him Victorious
Happy and Glorious
Soon to Reign Over Us
God Save The King."

Divided from this verse by two upright designs of interlaced delicate scrolls is the following:—

"God Bliss The PRINCE OF WALES
The True-born Prince of Wales,
Sent us by THEE:
Grant us one favour more
The King for to Restore
As Thou hast done before
The FAMILIE."

The cypher "J. R." conceals the figure 8. *Circa 1725.*

This is one of about a dozen similar glasses, now recorded, that were made to commemorate the Jacobite rising of 1715, an attempt to place the " Old Pretender," James Francis Edward, eldest son of James II, upon the thrones of England and of Scotland as James III and James VIII respectively. On this glass " the True-born Prince of Wales " is also commemorated. Charles Edward, the " Young Pretender," was born on December 31st, 1721. Hartshorne (*Old English Glasses*, p. 349) suggested the probability of these glasses being engraved in France and introduced into England in 1722 for distribution among the Stuart adherents. A glass engraved in the same manner was sold at Sothebys on March 19th, 1926, which bears, *inter alia*, the inscription " Vive la Roye."

91A. A WINE GLASS, 6¾ inches high. The drawn funnel-shaped bowl is wheel-engraved with a border of grapes and vine leaves. The central knop of the fine baluster stem contains " air beads." The round foot is plain. *Circa 1745.*

The decoration of English glasses by means of engraving with the wheel was introduced from Bohemia into England early in the 18th century. German engraved glasses were brought to England towards the end of the 17th century. There were German glass engravers at work in London at about the end of the first quarter of the 18th century.

91B. A WINE GLASS, 5¾ inches high. The waisted bell-shaped bowl is wheel-engraved with a conventional border of foliage and scrolls. The baluster stem is above a plain round foot. *Circa 1735.*

91C. A WINE GLASS, 6¼ inches high. The waisted bell-shaped bowl is wheel-engraved with a border of grapes and vine leaves. The light baluster stem is above a plain round foot. *Circa 1735.*

92A. A JUG AND COVER, 9¾ inches high to the top of the cover. The upper half of the jug is slightly concave, the lower part is convex. The large handle is broad and hollow. The cover has a projection over the front lip of the jug and is surmounted by a finial that contains " air beads." The jug and cover are moulded in a formal pineapple pattern.

Circa 1735.

92B. A TANKARD, 5½ inches high and 8½ inches high to the top of the cover. Towards the rim are two depressed rings; below the centre is a narrow rounded applied band. It is 4¼ inches in diameter at the rim and 5 inches in diameter at the projecting base. The cover, which is surmounted by a finial that contains elongated "air bubbles," is inverted double-ogee shape. The large wide, flat handle springs from a point 1½ inches below the rim and terminates against the projecting base.

Circa 1735.

93A. A Cordial Glass, 6¾ inches high. Around the top of the straight-sided bowl, above a band of conventional ornament, is wheel-engraved "THE GLORIOUS MEMORY OF KING WILL. III." The plain stem contains a long "air tear." The foot is domed and has the edge folded from above.

Circa 1745.

A glass engraved in commemoration of William III, who was born at The Hague, November 14th, 1650, only son of William II, Prince of Orange and the Princess Mary his wife, who was the eldest daughter of King Charles I. He was crowned King of England on April 11th, 1689, and died March 8th, 1702. Hartshorne (*Old English Glasses*, p. 378) expresses the view that it is "a well established fact that the Williamite glasses were not made or decorated primarily for Orange clubs, but for use in private houses on special days of Orange festivals—1st July, the day of the Boyne; 4th November, the King's birthday and wedding day, etc."

Francis Buckley (*Old English Glass*, p. 73) attributes the origin of the plain stem to the long "flute" glasses of the 17th century, that were made in the Netherlands and perhaps elsewhere (Nos. 57A and 58), and concludes that "there is not much to suggest that plain stemmed glasses were at all common before 1714. At this point the waisted types of bowl and bowls with expanded tops came into fashion: and the day of the plain stemmed glass was soon to dawn."

93B. A Candlestick, 8⅜ inches high. The bobêche is plain. The upper part of the baluster stem contains a circle of "air beads"; the lower part is moulded with raised ribs. The heavy domed foot is 4¾ inches in diameter.

Circa 1750.

The Silesian shouldered stem was introduced into England shortly after the Peace of Utrecht, 1713 (which enabled large quantities of German wares to reach the Netherlands, bringing with them German influences), and the accession to the English throne of a German King, in the person of George I, in 1714.

94A. A Sweetmeat Glass, 6⅞ inches high. The "double ogee" bowl has a shaped edge; the upper part is cut in a geometrical faceted design, the lower part in vertical bands. The moulded pedestal stem is above a domed and moulded round foot. *Circa 1740.*

Cutting was done by the same instrument as wheel-engraving—the lapidary's wheel. In the opinion of Francis Buckley it was introduced into England from Bohemia not much earlier than 1727, although by 1735 it was very well advertised. Most of the English faceted glass ranges in date between 1750 and 1775.

94B. A SWEETMEAT GLASS, 4⅛ inches high. The bell-shaped bowl has a shaped edge and is cut with a faceted scroll ornament. The stem has a single cut and faceted knop and is above a nine-sided cut foot. *Circa 1745–1750.*

95. A TANKARD WITH HANDLE, 7¾ inches high. The bowl has three ribbed bands beneath the rim and another around the centre; the lower part is moulded in a conventional design. The stem is a hollow bulb with four applied "strawberry" bosses which encloses a George II shilling dated 1745. The domed foot is ridged. *Circa 1745.*

Probably commemorative of the Jacobite rising of 1745, an attempt to place the Young Pretender, Charles James Edward, son of the Old Pretender, upon the thrones of England and Scotland.

96A. A WINE GLASS, 6⅜ inches high. The trumpet-shaped bowl and stem are drawn. The stem contains a bright double spiral of "air threads." The plain foot is round. *Circa 1760.*

The "air twist" stem appears to be derived from the Venetian hollow knop (No. 83). Apparently the workers of English flint glass had difficulty, owing to the metal used, in making the hollow knops, an air bubble often being the result (No. 86A). Later, numbers of air bubbles were placed in the knop (No. 72), or in the finial of the cover as a decoration (No. 86B). It may have happened that the accidental elongation of these bubbles (No. 74C) suggested the possibility of what became known as "air twists." By the definite arrangement of the air bubbles and by twisting the stem complicated designs of "air threads" and "cables" were produced (Nos. 96A, 98E, and 98F). Francis Buckley (*Old English Glass*, p. 54) suggests that the "air-twisted stem came into fashion in London about 1739 and went out of fashion in London between 1758 and 1766."

96B. A WINE GLASS, 6½ inches high. The border of the waisted bell-shaped bowl is wheel-engraved with a conventional design of scroll foliage and flowers. Beneath the bowl is a double collar. The double-knopped stem contains spiral " air threads." The plain foot is round.

Circa 1740.

96C. A Wine Glass, 6⅜ inches high. On the slightly concave straight-sided bowl are wheel-engraved the arms and crest of the Poppleton family. The double-knopped stem contains spiral " air threads." The plain foot is round. *Circa 1740.*

96D. A Wine Glass, 6⅜ inches high, with drawn bowl and stem. On the bowl are wheel-engraved " P.C.," a Stuart rose with two buds, " Fiat " and an oak leaf. The straight stem contains spiral " air threads." The round foot is plain. *Circa 1750.*

A Jacobite glass, used probably in one of the clubs, such as " The Cycle," that existed in the West of England for the furtherance of the Stuart cause during the greater part of the 18th century. The initials P.C. no doubt refer to Prince Charles. The oak leaf refers to the Restoration. Fiat is taken to be the " word " of the Cycle. The heraldic rose and two buds usually are assumed to represent James II, the Old and the Young Pretenders, but Dillon suggests (*Glass*, p. 330) that they may refer to the Old Pretender and his two sons, Charles Edward and Henry.

96E. A Wine Glass, 5⅞ inches high. On the straight-sided bowl a Stuart rose with two buds, " Fiat " and an oak leaf are wheel-engraved. The straight stem contains spiral " air threads." The round foot is plain. *Circa 1750.*

A Jacobite glass.

96F. A Wine Glass, 6½ inches high, with drawn bowl and stem. On the bowl the Stuart rose and one bud are wheel-engraved. The stem contains spiral " air threads." The round foot is plain. *Circa 1750.*

A Jacobite glass.

97. A Wine Glass, 6 inches high. On the straight-sided bowl, a full-faced portrait of Prince Charles Edward Stuart, the Young Pretender, is engraved within a medallion. Above the medallion are the words " AUDENTIOR IBO." On either side is an heraldic rose with one bud and a thistle. The double-knopped stem contains spiral " air threads." The plain foot is round. *1745–1750.*

This glass is referred to by Hartshorne in *Old English Glasses* (p. 361) and is there illustrated (Plate 59). Hartshorne, in a letter (October 24th,

1893) to the then owner, Mr. Harman Oates, gave it as his opinion that portrait glasses such as this were made in Newcastle and Bristol and that they were "master" glasses of sets of Jacobite glasses. They were, of course, commemorative of the rising of "Bonnie Prince Charlie" in 1745. The heraldic rose and bud are emblematic of England and the Stewart family (see 96D), and the thistle, of Scotland.

98A. A WINE GLASS, $6\frac{1}{8}$ inches high. Around the border of the "double ogee" bowl a design of a rose, a carnation, and a piece of honeysuckle is wheel-engraved. The stem has a swelling knop in the centre and contains spiral "air threads." The plain foot is round. *Circa 1750.*

98B. A WINE GLASS, $5\frac{3}{4}$ inches high. On the thick straight-sided bowl the arms of the city of Norwich are wheel-engraved with grapes (polished) and vine leaves on either side. The stem has a knop at the top and a smaller one at the base, and contains spiral "air threads." The plain foot is round. *Circa 1750.*

98C. A WINE GLASS, $6\frac{1}{4}$ inches high. The bell-shaped bowl is delicately impressed with a trellis design and has engraved in diamond point, around the border, "Coventry Unity Navigation Trade." The straight stem is spirally incised. The plain foot is round. *Circa 1750.*

The spiral ribbing in the stem has been obtained by twisting the stem.

98D. A WINE GLASS, $6\frac{3}{8}$ inches high. The bowl is straight sided. The straight stem contains a double spiral of fine "air threads." The plain foot is round. *Circa 1760.*

98E. A WINE GLASS, $6\frac{1}{4}$ inches high. On the straight-sided bowl a basket of fruit and flowers and two butterflies are wheel-engraved and partly polished. The straight stem contains a spiral column of compact "air threads." The round foot has the edge folded from above. *Circa 1760.*

98F. A CORDIAL GLASS, $6\frac{1}{2}$ inches high. The small bowl is bucket shaped. The straight stem contains two spirals of "air threads," one inside the other. The plain foot is round. *Circa 1770.*

99A. A WINE GLASS, $6\frac{1}{8}$ inches high. The "double ogee" bowl is above a stem which slightly tapers downwards and which contains two spiral threads, one opaque white, the other an "air thread." The round foot is plain. *Circa 1770.*

99B. An Ale Glass, 7½ inches high. The tall straight-sided bowl is decorated with wheel-engraved and polished hops and barley. The straight stem is cut in facets. The round foot is plain. *Circa 1770.*

99C. A Bowl, 4½ inches high and 8½ inches in diameter, finely wheel-engraved with the arms of the Ferguson-Davie family, two vine leaves, and a bunch of grapes (the latter polished) on each side, and a flower with leaves. On a plain foot ¾ of an inch high. *Circa 1760.*

100A. A Wine Glass, 4¼ inches high, with a straight-sided bowl on a stem with opaque white spiral threads and a plain round foot. The bowl is decorated in white enamel with grapes and vine leaves, the initials "H.C." and the date "1764." *1764.*

The opaque twisted stems, according to Apsley Pellatt (who was a glass maker), writing in *Glass Manufacturers* (p. 25) in 1821, were invented by the Bohemians. Apparently as a result of the Treaty of Utrecht the invention was carried to the Netherlands and thence to England. The method of manufacture was similar to the "threaded" glass of the Venetians of the 16th and 17th centuries, which in turn was a revival of a similar art practised by the early Romans. In Francis Buckley's opinion such glasses were not made commonly in England so early as 1745: glasses with opaque twisted stems were described in the middle of the 18th century as "enamel glass."

The application of enamel decoration in England probably started, according to Francis Buckley, as early as 1762, when Michael Edkins was employed to decorate glasses in Bristol.

100B and C. A pair of Wine Glasses, 6⅝ inches high, with straight-sided bowls on stems with opaque white spiral threads and plain round feet. The borders of the bowls are decorated in white enamel with scroll foliage and flowers. The words "Elizth Smith" are on the bowl of one glass, and "Jno. Smith" on the bowl of the other. There are traces of gold on the rims. *Circa 1770.*

101A. A Goblet, 7¾ inches high, with a bucket-shaped bowl on a stem with opaque white spiral threads, above a plain round foot. The bowl is decorated in white enamel, on one side with a landscape and ruins with figures, and on the other with a butterfly. Probably Bristol. *Circa 1760.*

101B. A Goblet, 7⅝ inches high, with an "ogee" bowl on a stem with opaque white spiral threads, on a plain round foot. On the bowl the words " Liberty & Clavering For Ever " in white enamel are enclosed in a scroll cartouche in red and yellow enamel surrounded by a decoration of white leaves. On the back are grapes, vine leaves, and insects in white. The edge of the bowl shows traces of gilding. *Circa 1775.*

Examples of English enamelling in colours are seldom seen. Clavering, here referred to, was Sir John Clavering (1722–1777), the political opponent of Warren Hastings.

102A. A PAIR OF WATERFORD BLOWN GLASS DECANTERS WITH STOPPERS, 10¼ inches high to the tops of the stoppers. There are triple-cluster collar bands around the necks. The lower parts of the bodies are moulded into fluting. On one side a crowned harp in a wreath of shamrock and laurel foliage is wheel-engraved, and on the other the words " Success to the Waterford Volunteers 1782," in a similar wreath.

Made in Ireland. 1782.

102B. A DECANTER, 11 inches high to the top of the stopper. On the neck are two double-indented collars ; the lower part of the body is lightly ribbed. On one side the word " Liberty " above a formal eagle is wheel-engraved ; on the other a circular device with a plain centre, above which, in a ribbon, are the words " American Independence."

Made in Ireland circa 1780.

NORTH AMERICAN GLASS

The first glass house in the United States was built at Jamestown, Virginia, in 1608, in which eight Poles and Germans were employed. These men (according to the U.S. Census Report of 1880) were brought to the United States by Captain Christopher Newport in his second voyage with colonists to that country. Some of the produce of this glass house constituted part of the first cargo exported from America (in 1609). A second glass house was built at the same place in 1620, at which the making of small beads was an important feature. Other early furnaces were built at Salem, Mass., in 1638 and at New York in 1654. The first where flint glass was made and the first to achieve real success was begun at Wistarberg in Salem County, New Jersey, in 1739, by Caspar Wistar, who had emigrated to Philadelphia at the age of twenty-one. Here, with the help of four glass workers from Rotterdam, he began to make bowls, dishes, jugs, round balls of various sizes for covering bowls, jugs, etc., and other articles of household use, although his furnaces depended chiefly upon the sale of window glass and of bottles. The work was carried on until 1780.

Furnaces were built in Connecticut in 1747; at Boston in 1749 and in 1750; at New Windsor, in the state of New York, in 1753; in New York and in Brooklyn in 1754.

Next in importance to the Wistarberg furnaces were those built by Henry William Stiegel, who was born at Cologne on May 13th, 1729. He built three glass works: the first in 1763 at Elizabeth, where bottles and window glass were made; the second at Manheim, Pennsylvania, in 1764; and the third and most important at the same place in 1769. Here coloured enamels were used for the first time in the United States in the decoration of glass. In 1770, Stiegel produced blue flint glass similar to that made in Bristol; but in 1774 he met with financial disaster and was forced to give up his enterprise.

Whilst the products of the early American furnaces frequently were articles of comparative beauty, they were crude and it cannot be claimed that they were of particular artistic merit. The workmen employed were of European origin, and naturally what they made was similar to the glasses to be found in the countries whence they had come, for which reason, in the absence of definite data, it is often impossible to decide whether glasses now attributed to American furnaces were made in that country or in Europe. It has already been pointed out that the same difficulties frequently arise, for similar reasons, when an attempt is made to differentiate between glasses made in various European countries.

103A. A ROUND BOTTLE-GREEN VASE with short neck, 2 inches high.

103B. A BROWN VASE in the shape of a human head terminating in a narrow neck, 3¼ inches high.

103C. A ROUND PEACOCK-BLUE DISH, 1¾ inches high. It is moulded in three tiers, and is 1⅜ inches in diameter at the base, 2 inches in diameter in the middle, and 2½ inches in diameter at the top.

103D. A ROYAL BLUE JUG with handle, 3¼ inches high.

103E. A DARK SAGE-GREEN JUG with handle, 5⅛ inches high.

103F. A DARK PEACOCK-BLUE JUG with handle, 4 inches high, delicately fluted from top to bottom.

These glasses, together with others, were purchased by the writer in 1891 at a small inn at Guadalupe, a village outside Mexico City. *Probably they were made during the second half of the 18th century.*

GLASS OF UNDETERMINED ORIGIN

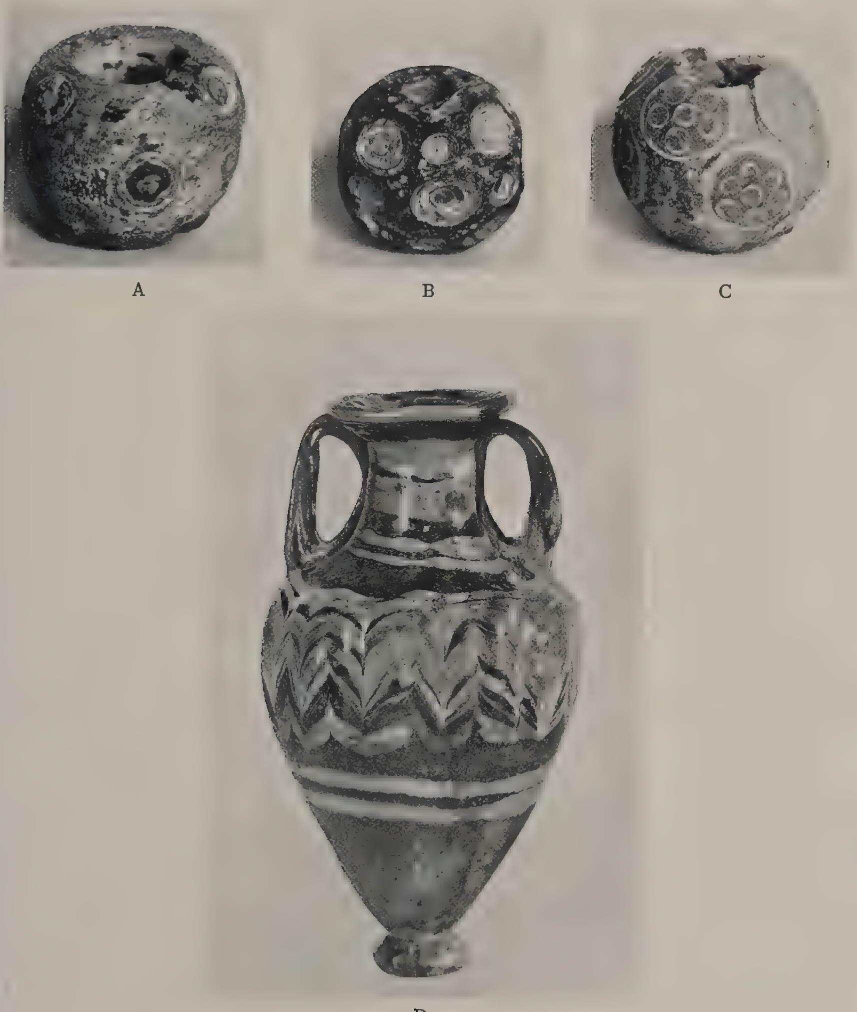
104A. A REDDISH BROWN FLATTENED BOTTLE, 6¾ inches high, with a small round handle and an ivory corked stopper 3 inches high. The entire body and neck are incised, one side of the body with an Arabic inscription which, translated, reads " Glory be to our Lord at Nasir " (the Victorious), and on the other with an Eastern design. The cutting is done so that the design is in relief; the background retains traces of gesso with which it was filled.

104B. A REDDISH BROWN FLATTENED BOTTLE, 8¼ inches high, with a small round handle and an ivory corked stopper 2¼ inches high. The entire body and neck are incised with texts and leafage. On one side (handle to right) is a Hebrew inscription which, translated, reads: " Behold the couch, which is Solomon's; three score warriors are about it, of the warriors of Israel (Canticles iii. 7). Mordecai the Physician. . . . This is my handiwork." On the reverse: " And King David was old and stricken in years; and they covered him with clothes, but he could get no heat (1 Kings i. 1). This is the handiwork of Mord (ecai), (of) Egypt, may God guard him and preserve him (and) may he prosper his hand ! " The cutting is done so that the design is in relief; the background retains traces of gesso with which it was filled.

PLATES

1

EGYPTIAN AND PHOENICIAN GLASS



A

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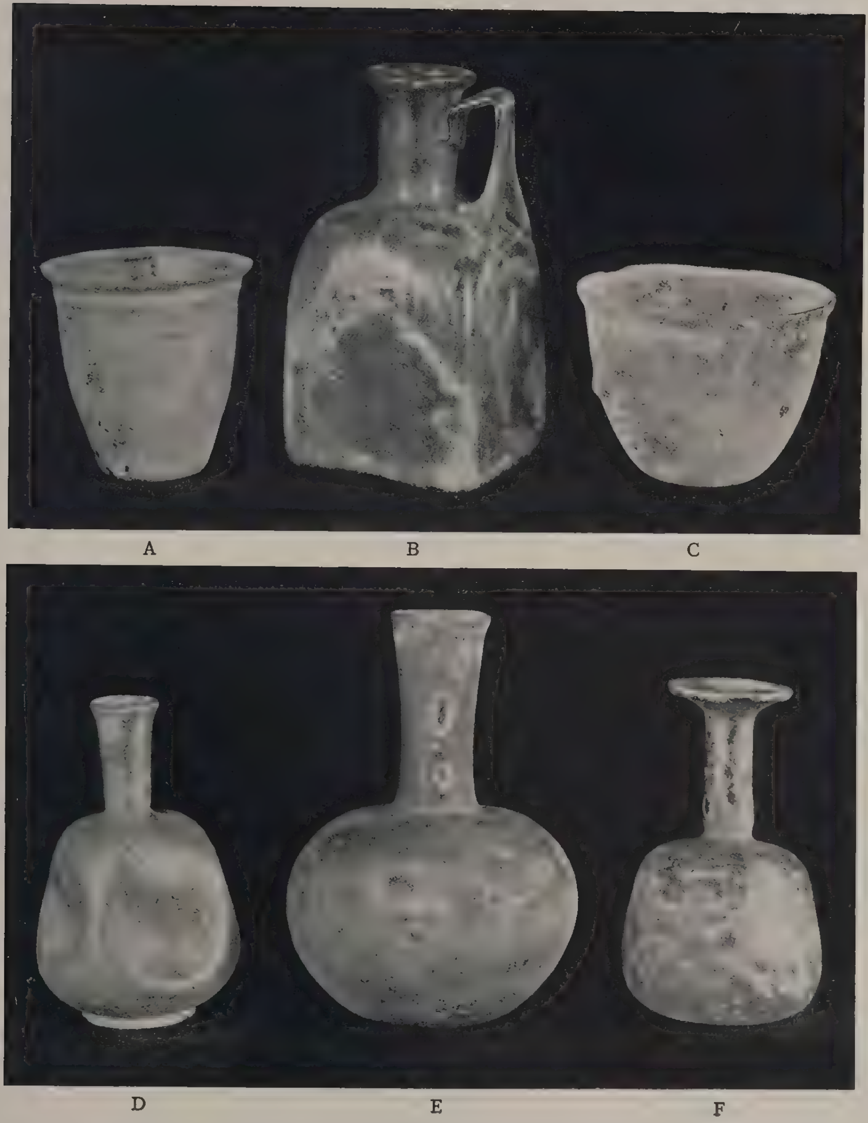
ROMAN GLASS



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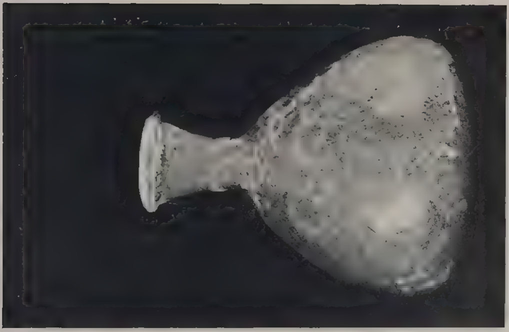
ROMAN GLASS



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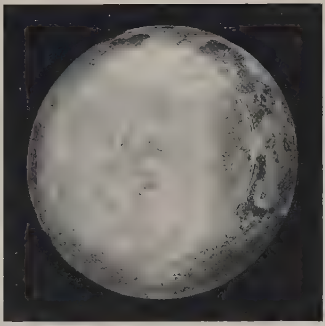

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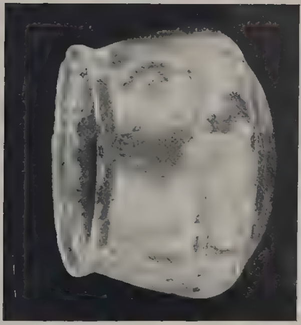

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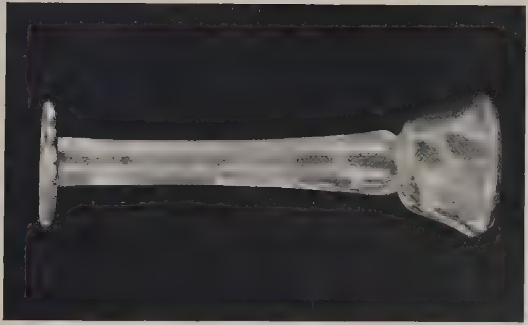

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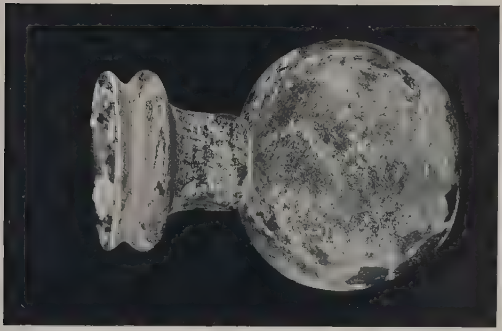

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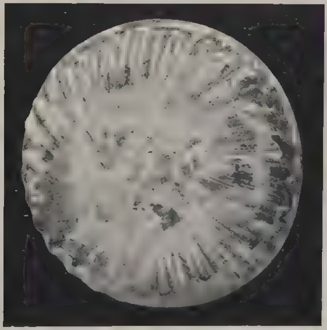

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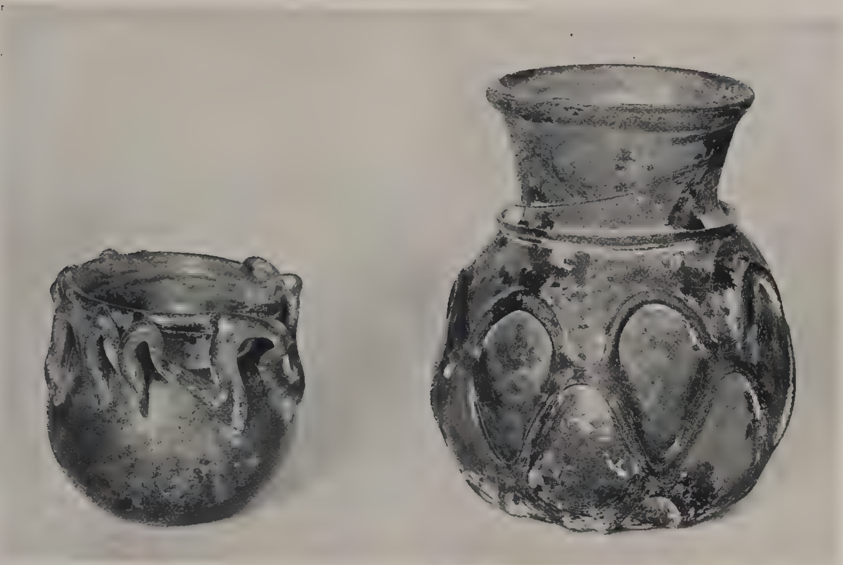
ROMAN GLASS



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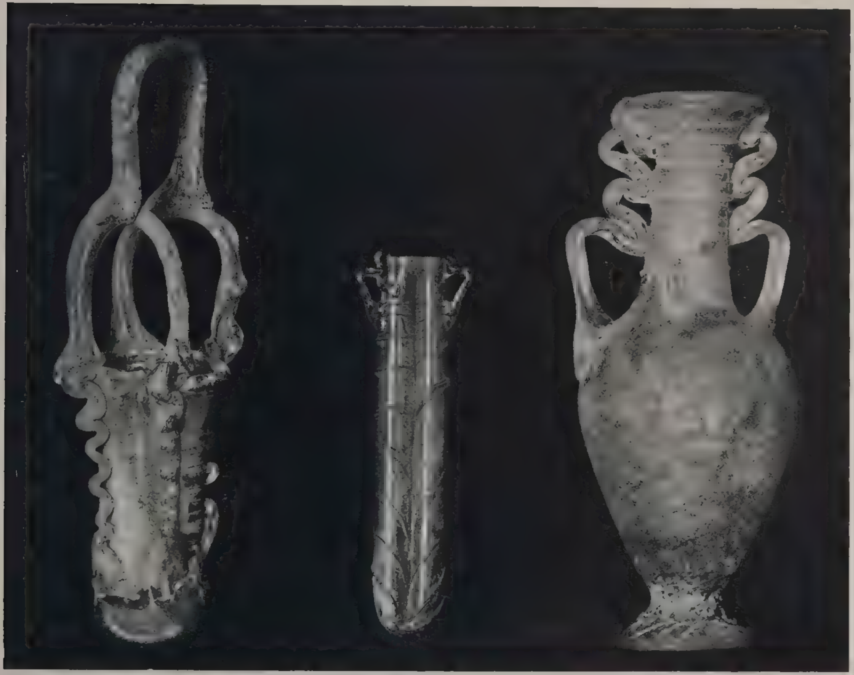

C D E

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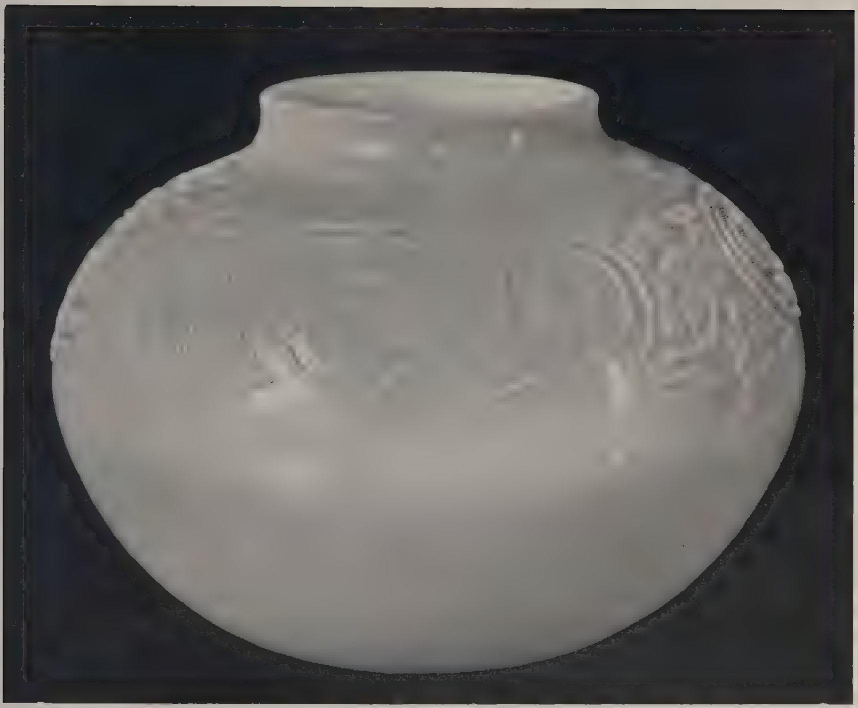
CHINESE GLASS



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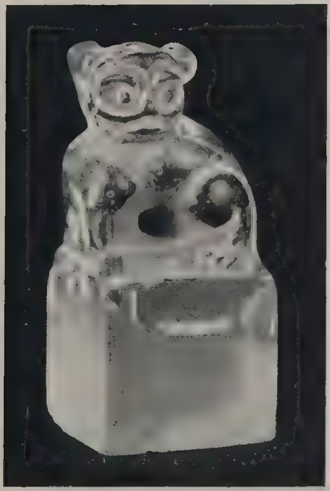

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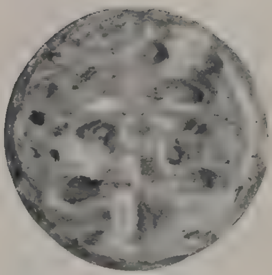

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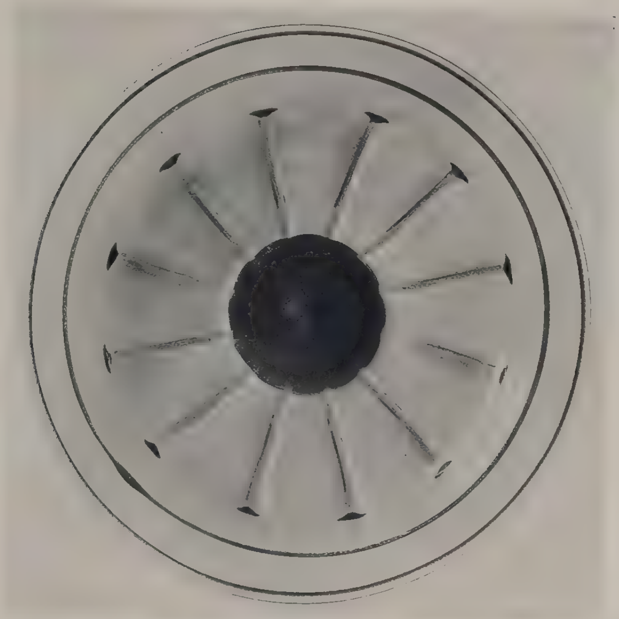
ITALIAN GLASS



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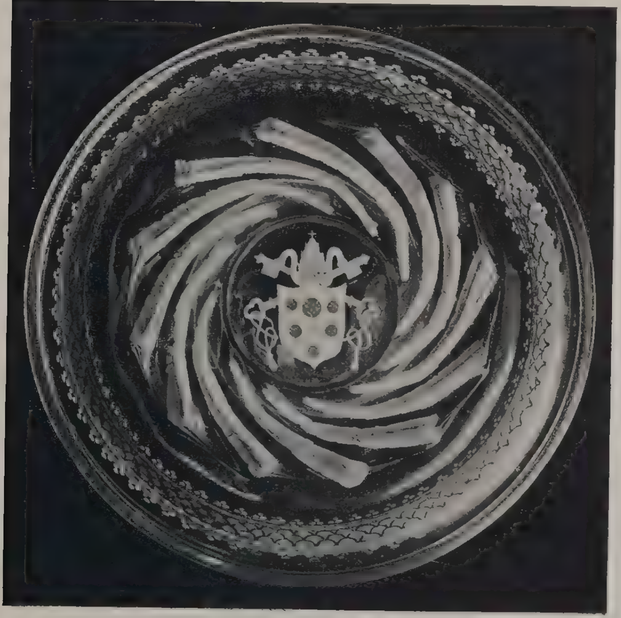

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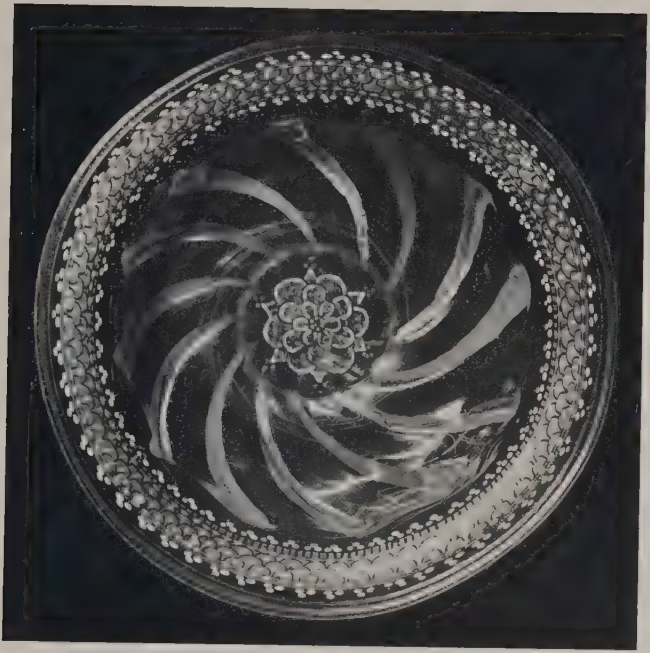
ITALIAN GLASS



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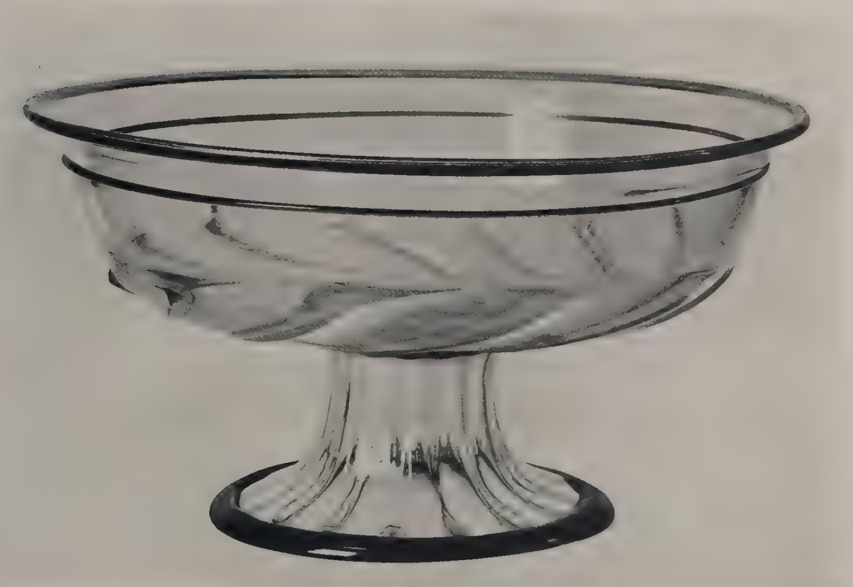

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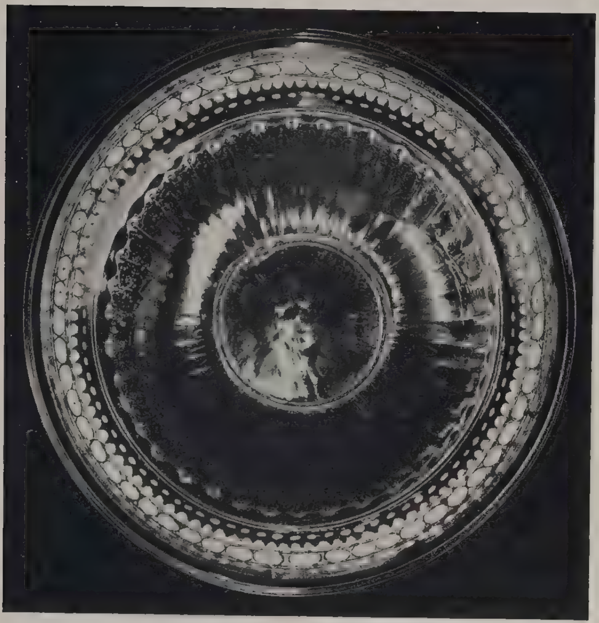
ITALIAN GLASS



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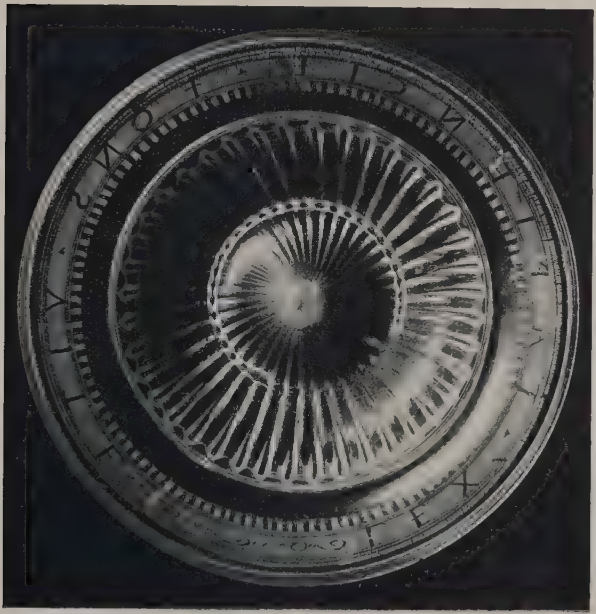

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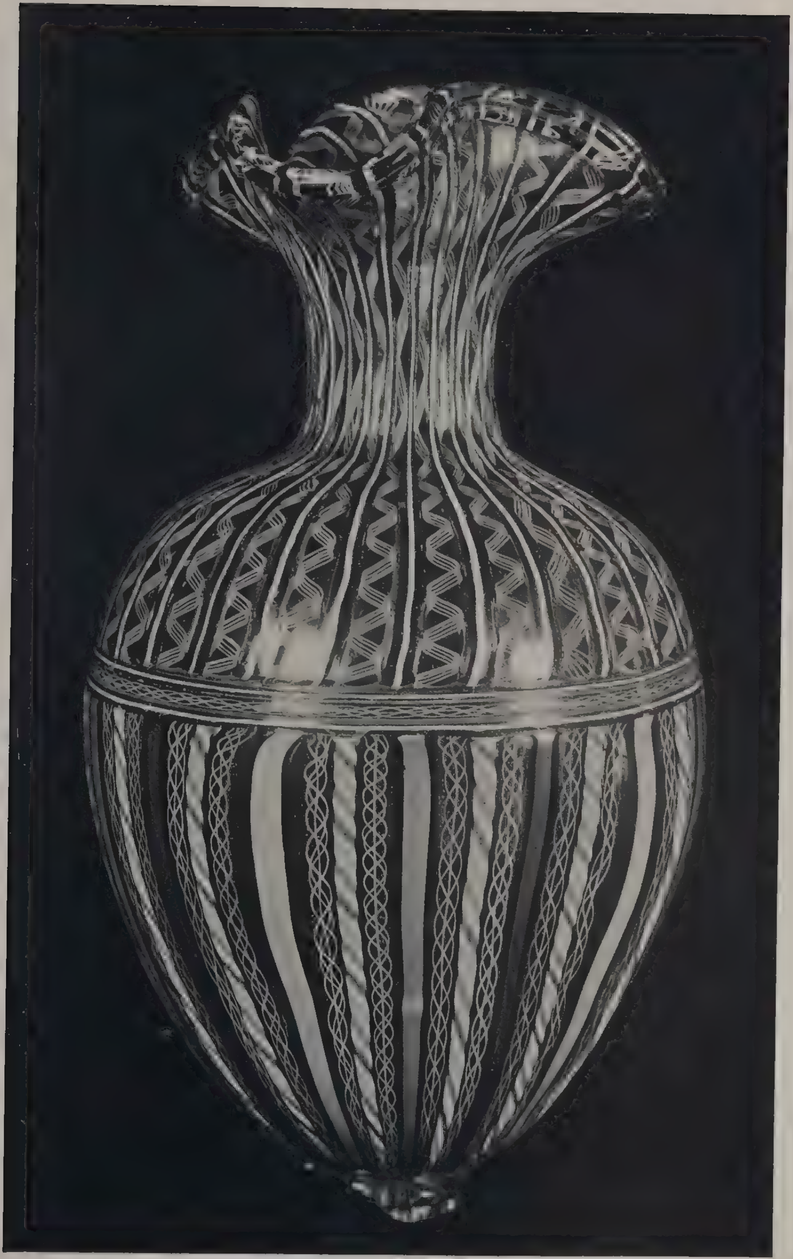
ITALIAN GLASS



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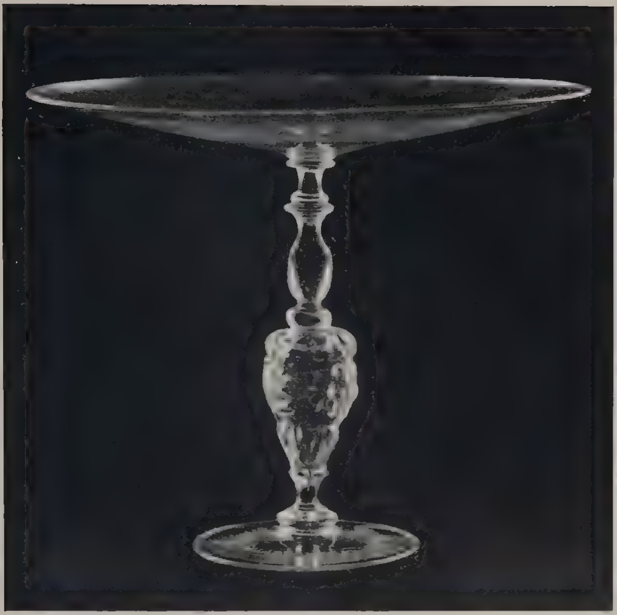
ITALIAN GLASS



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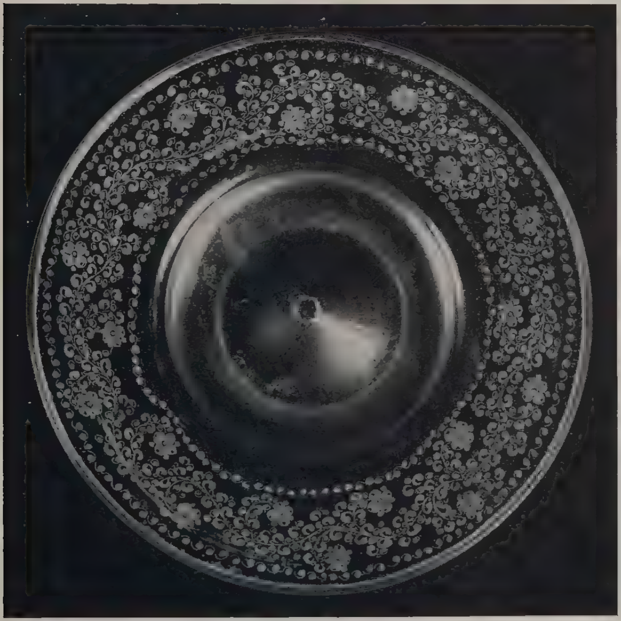

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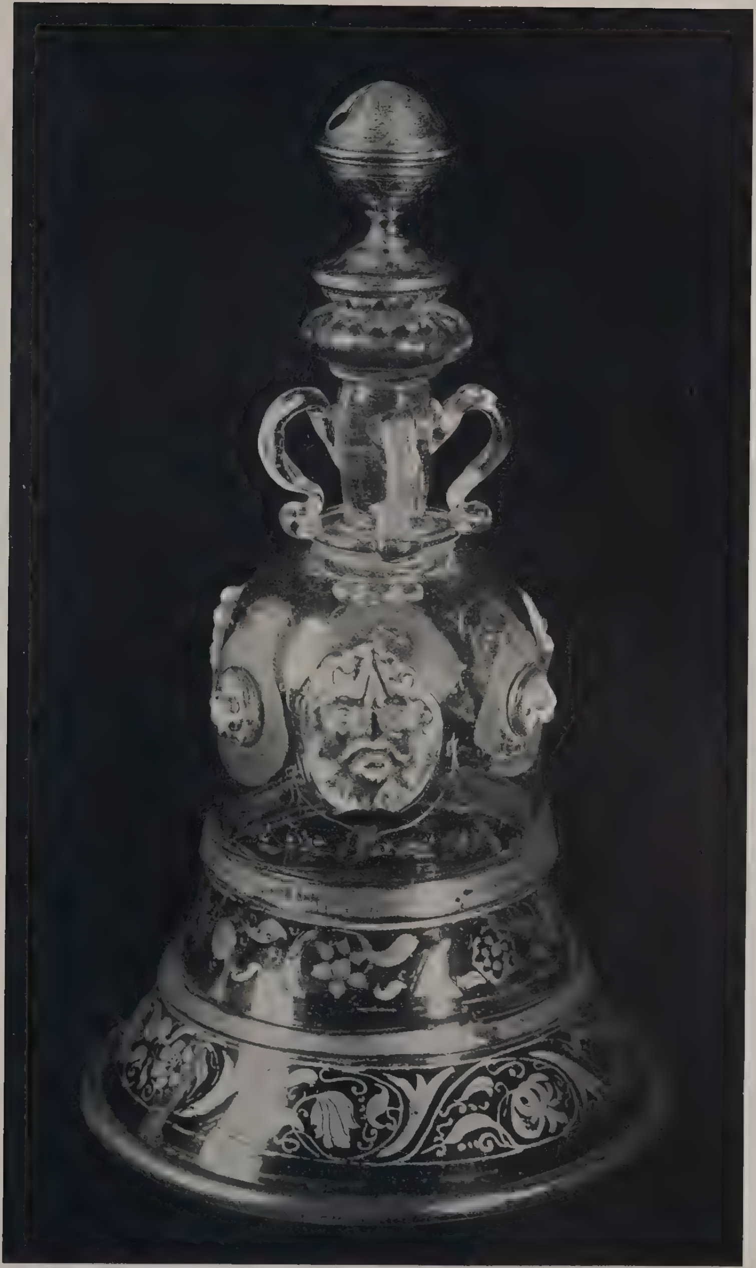
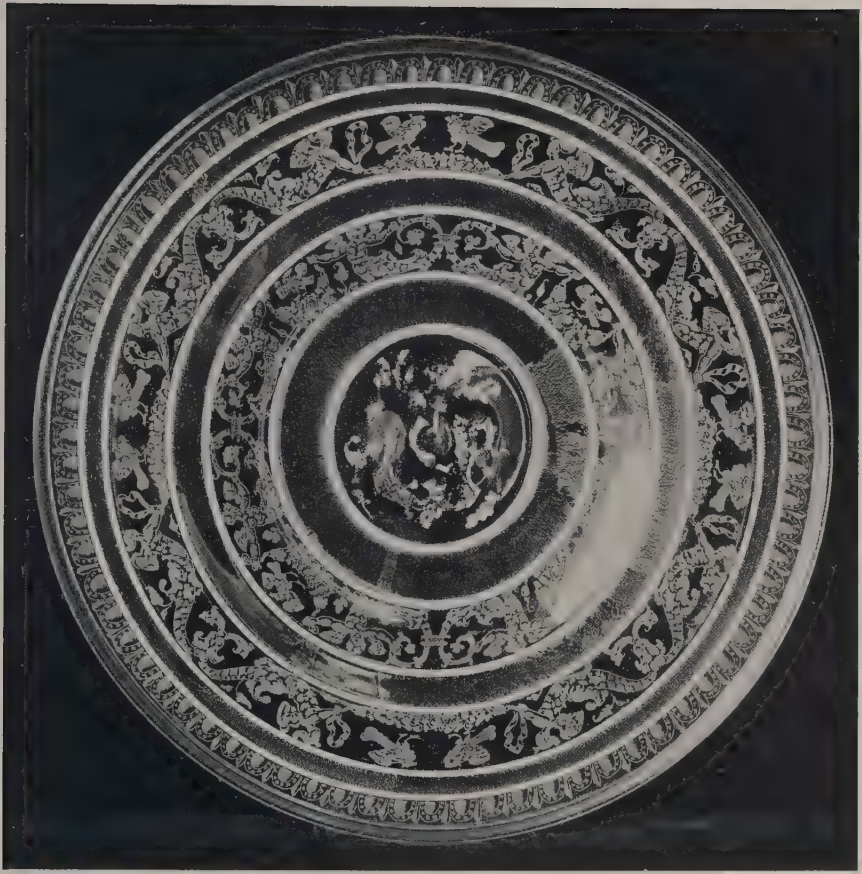
ITALIAN GLASS



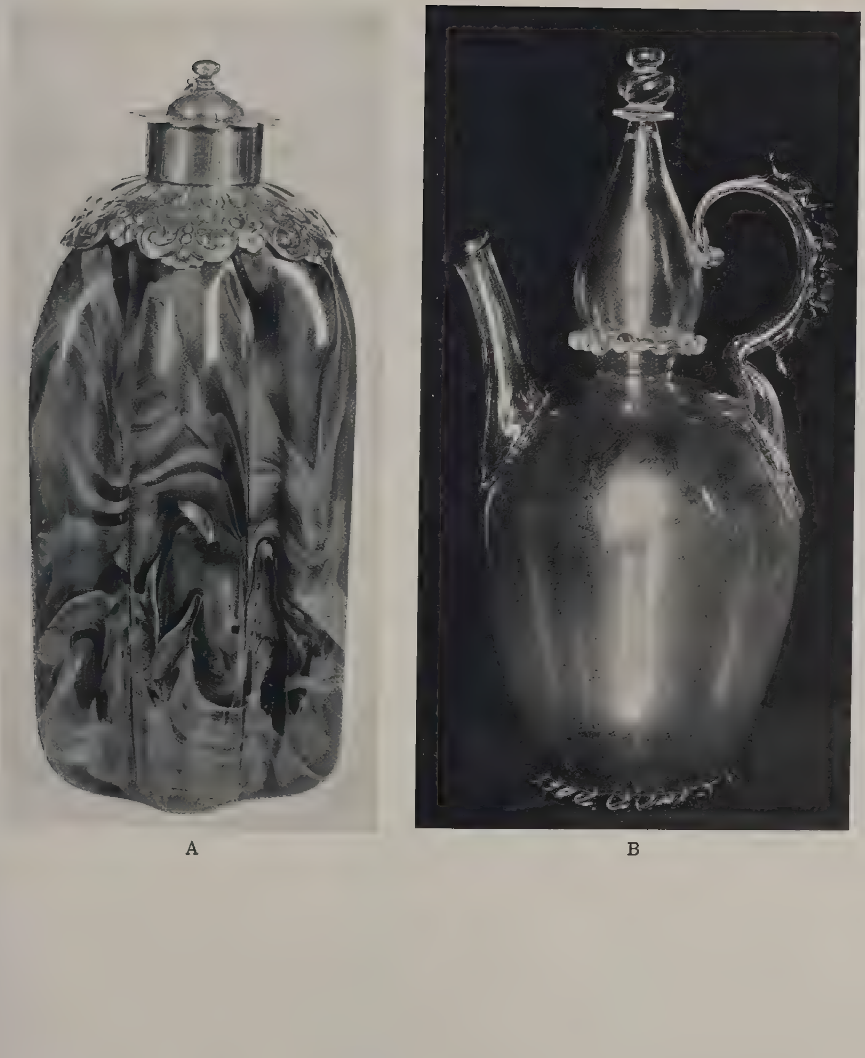
12

ITALIAN GLASS



13

ITALIAN GLASS



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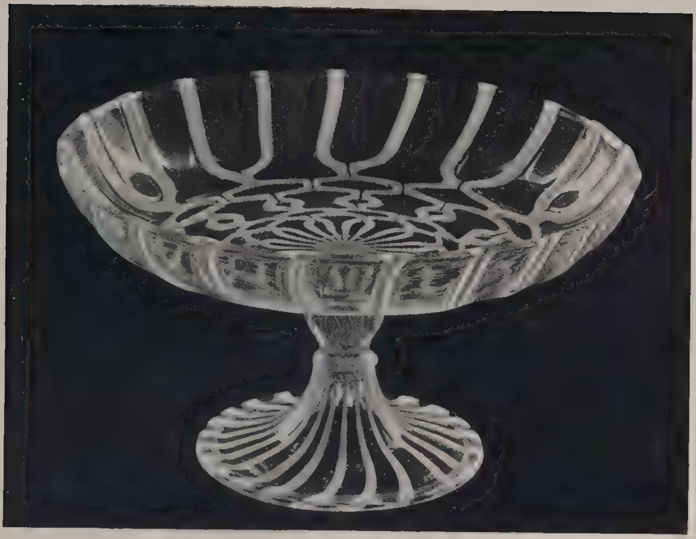

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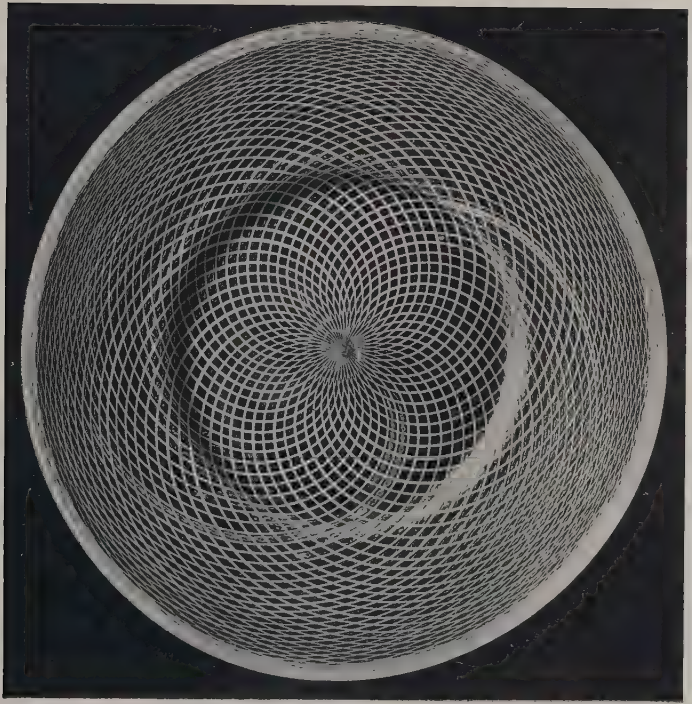

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15

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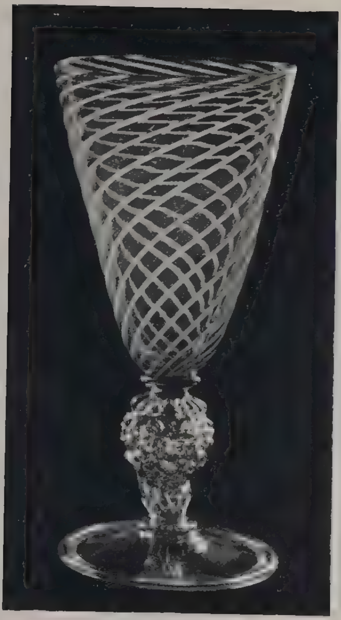

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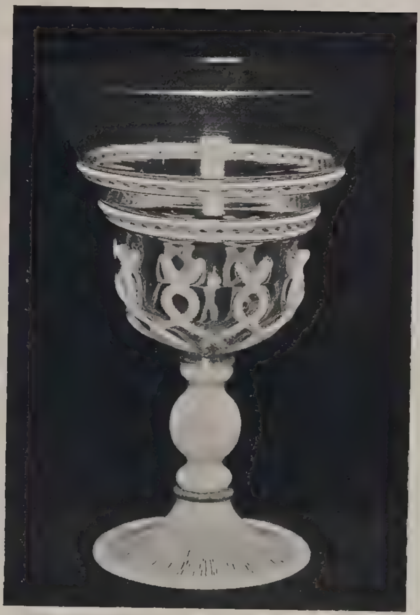

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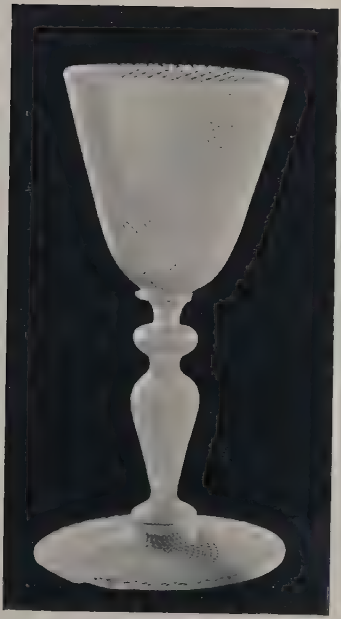

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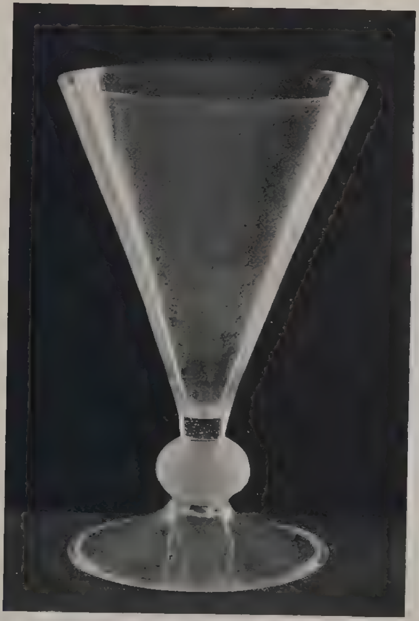

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16

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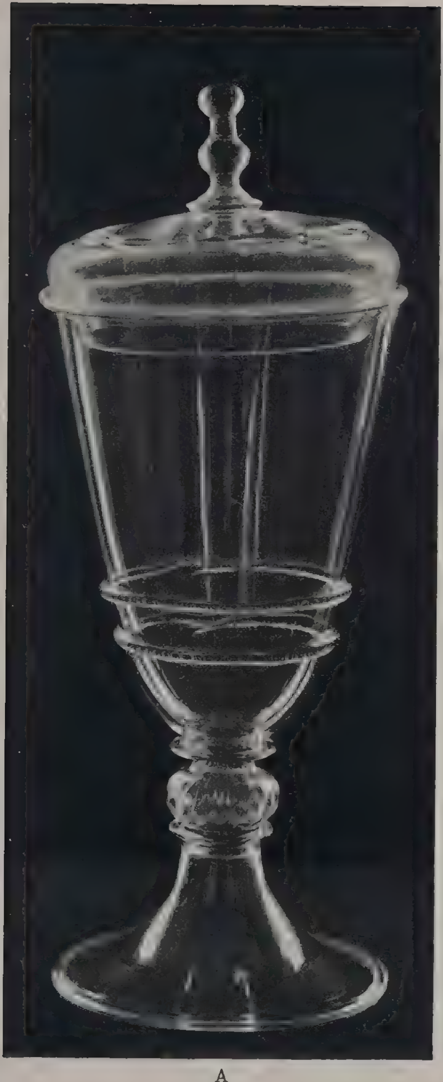

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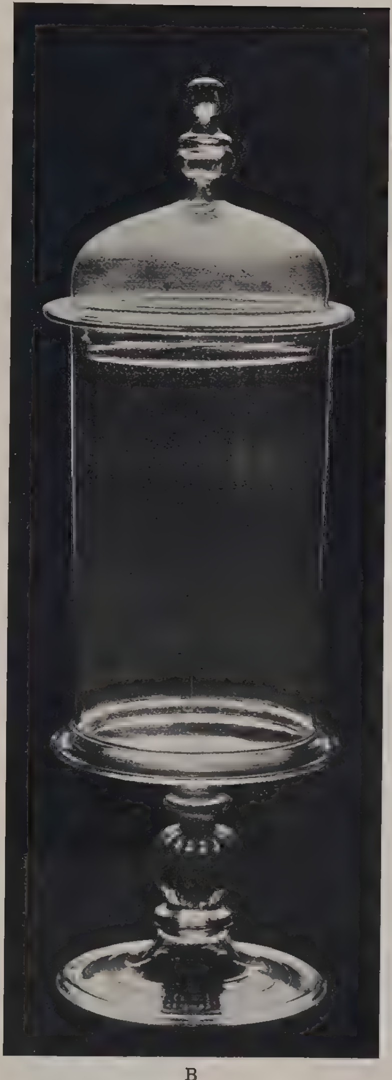

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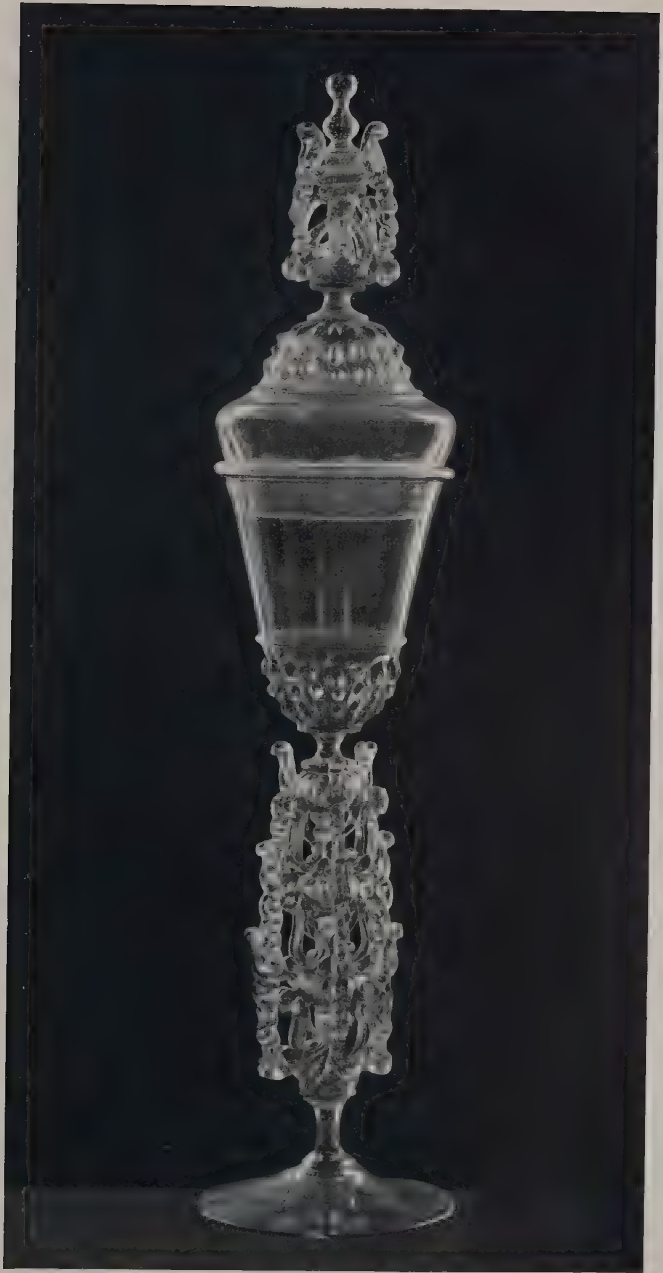

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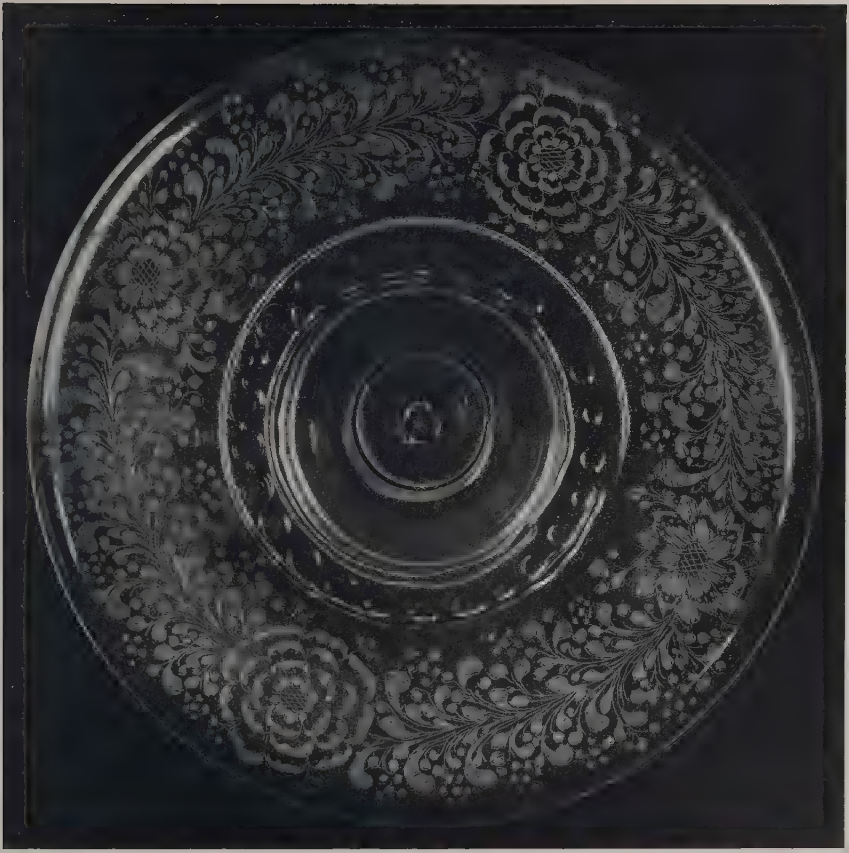

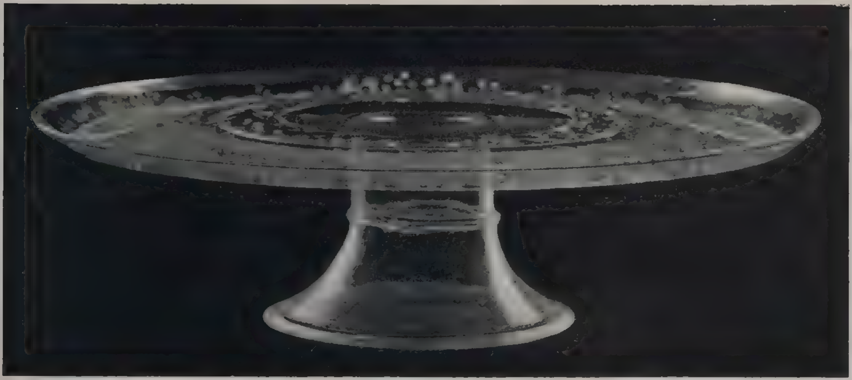

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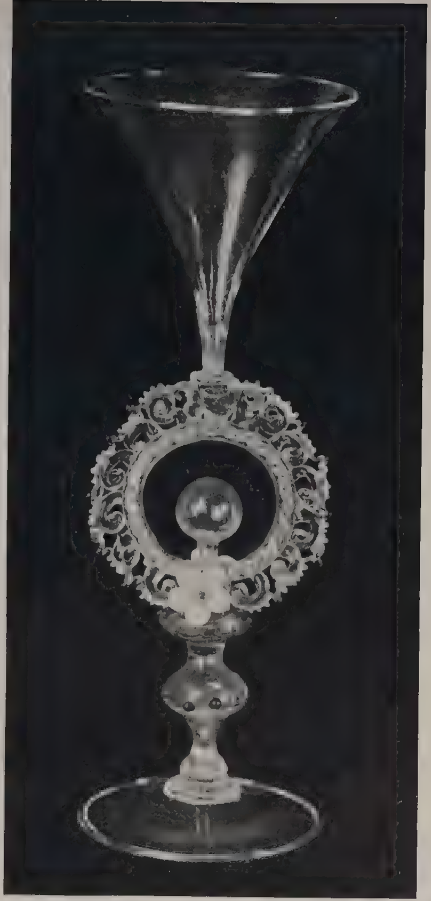

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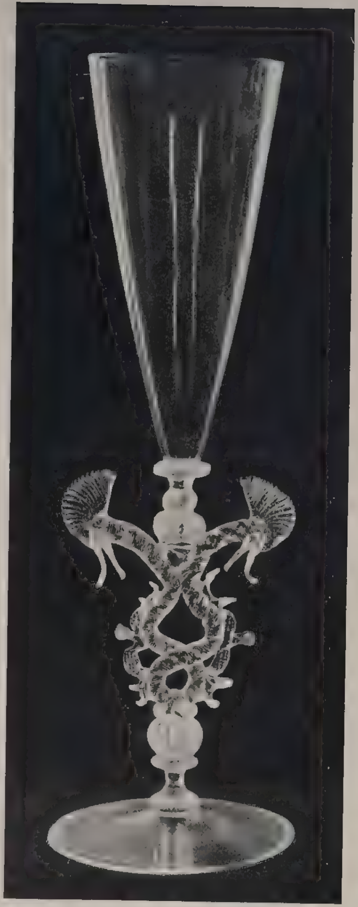

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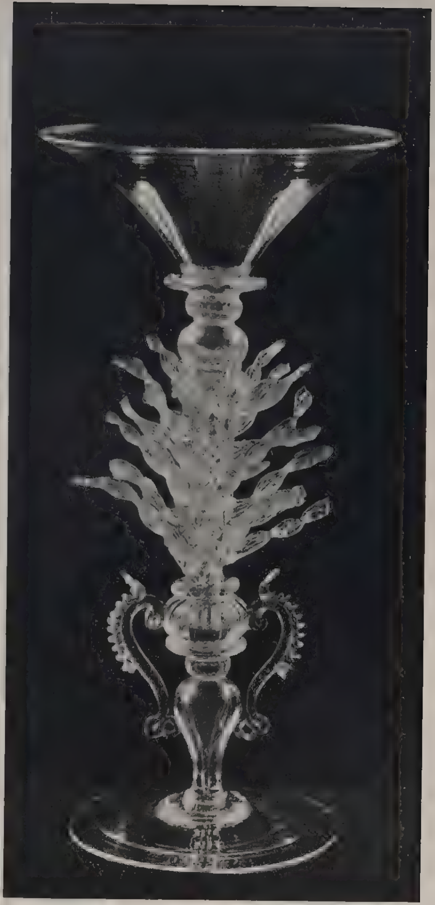

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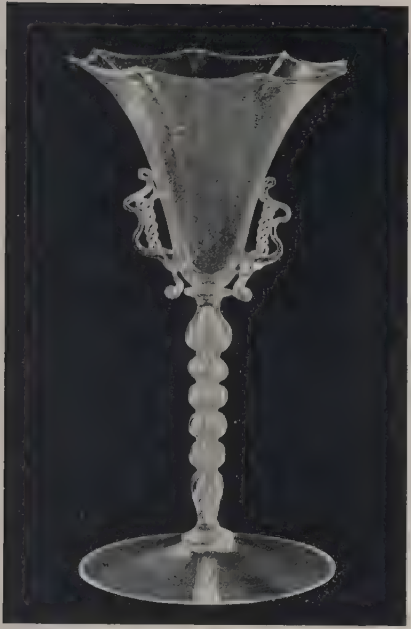

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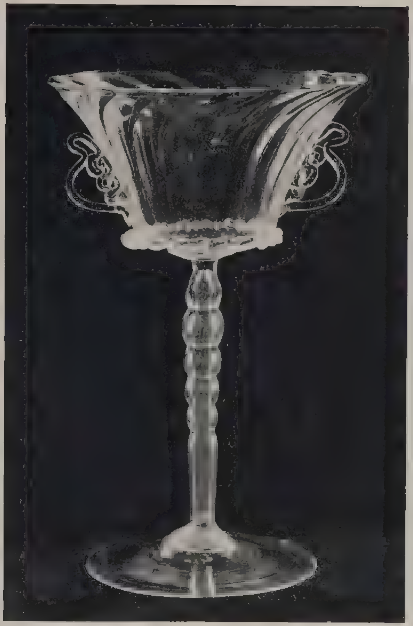

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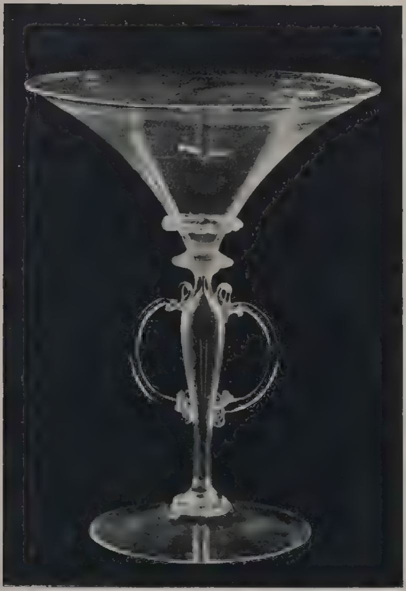

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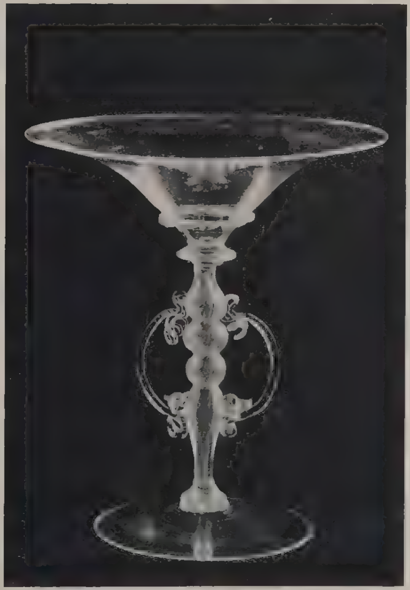

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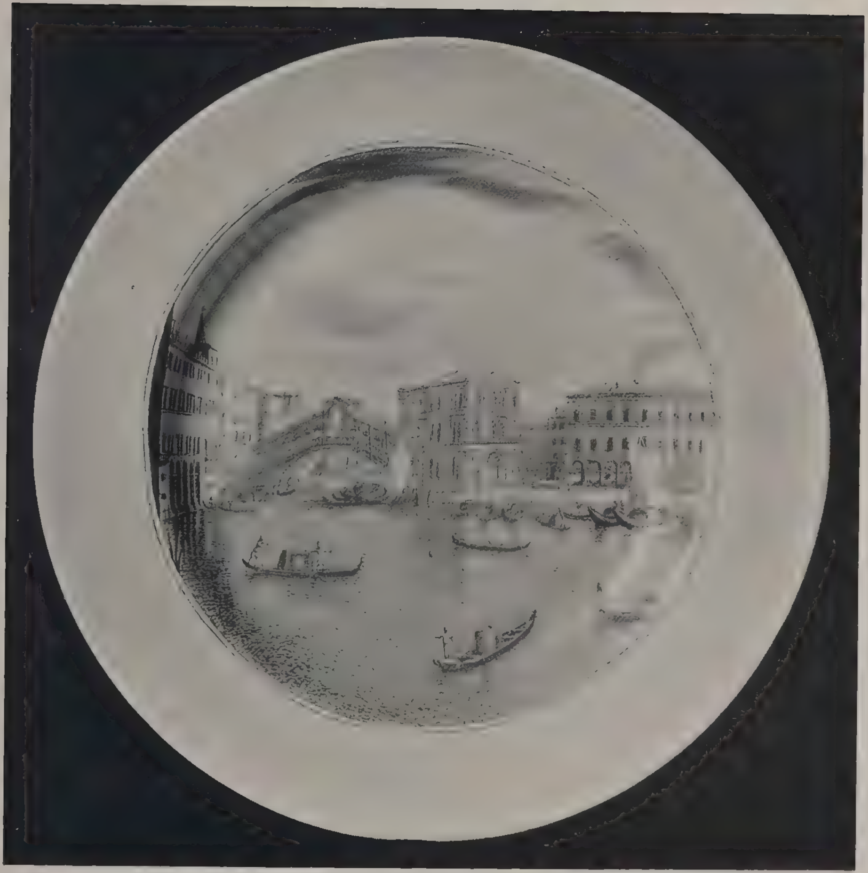

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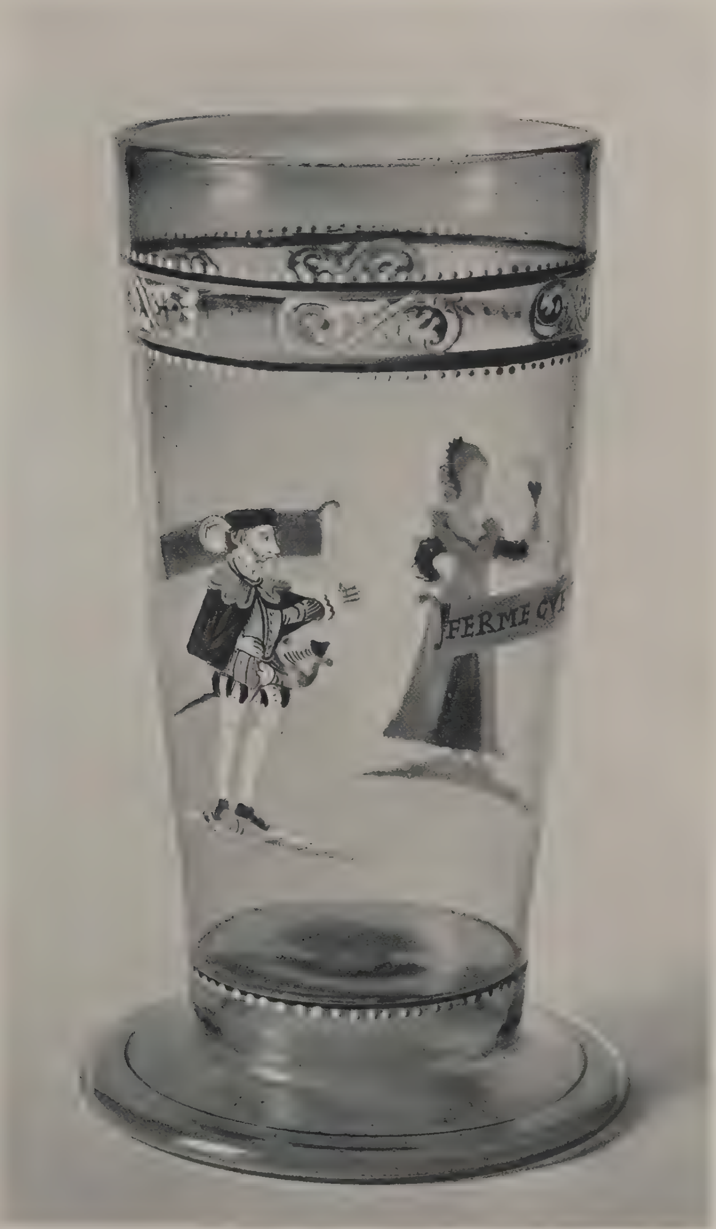

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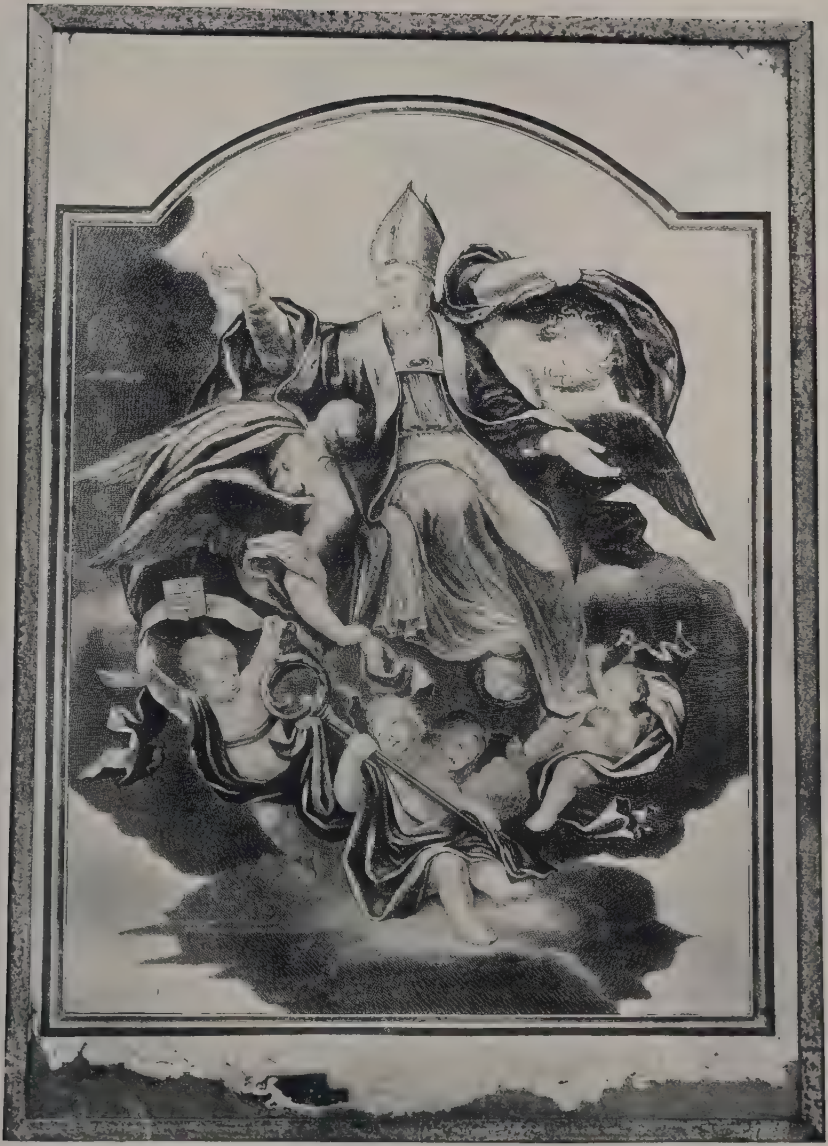

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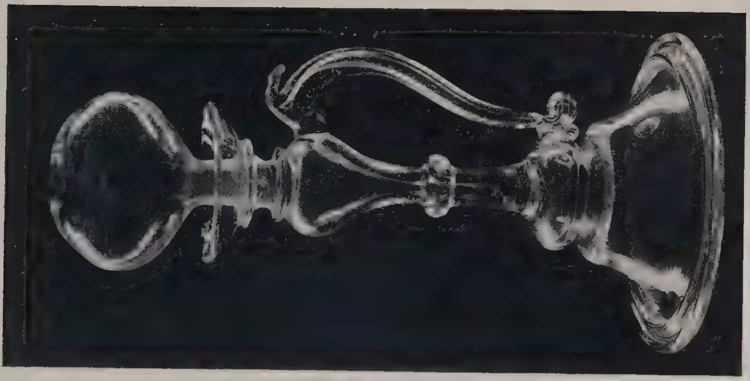

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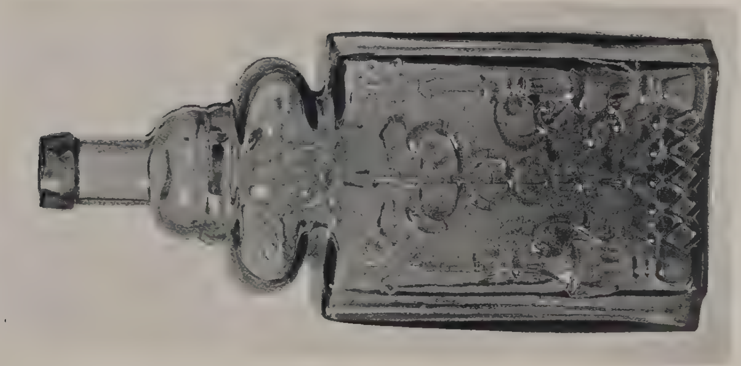

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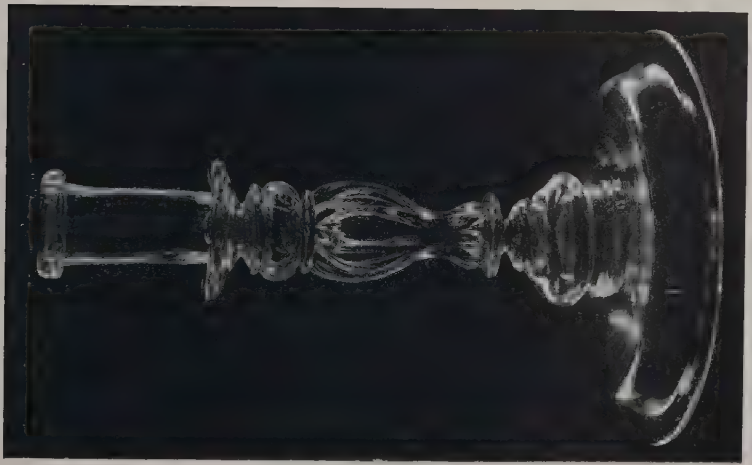

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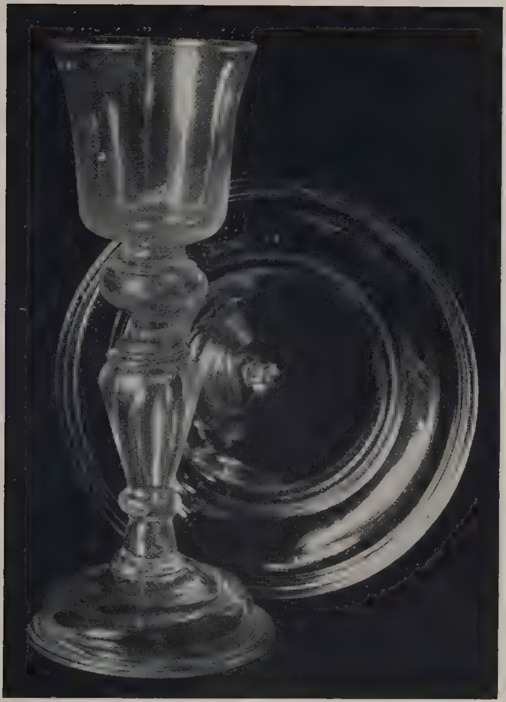

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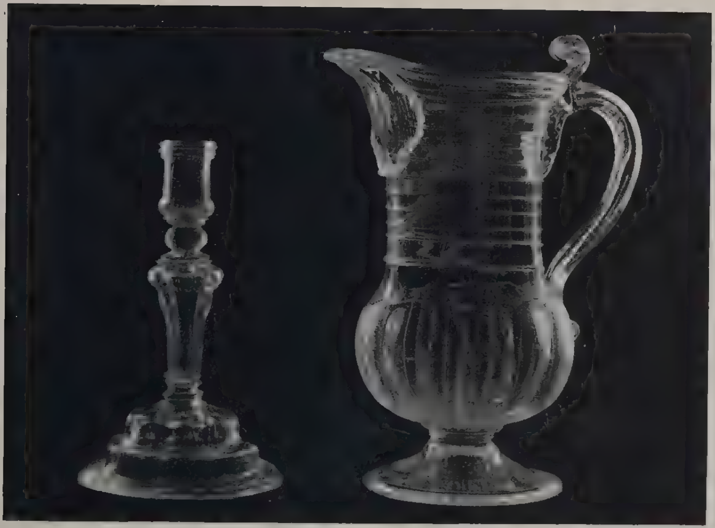

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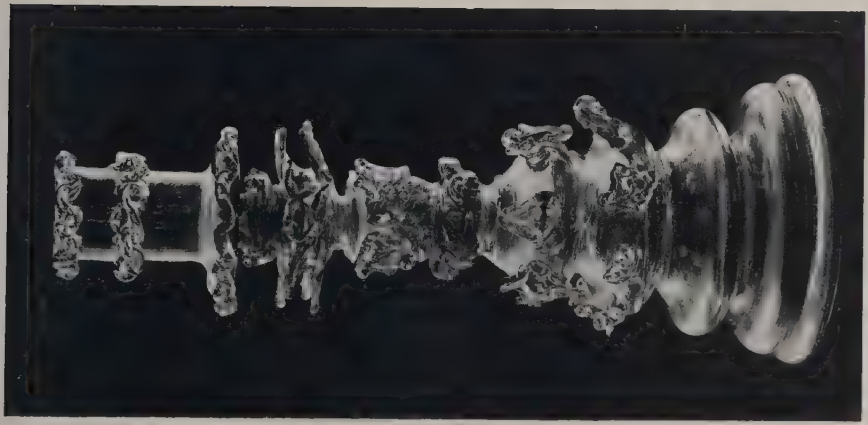

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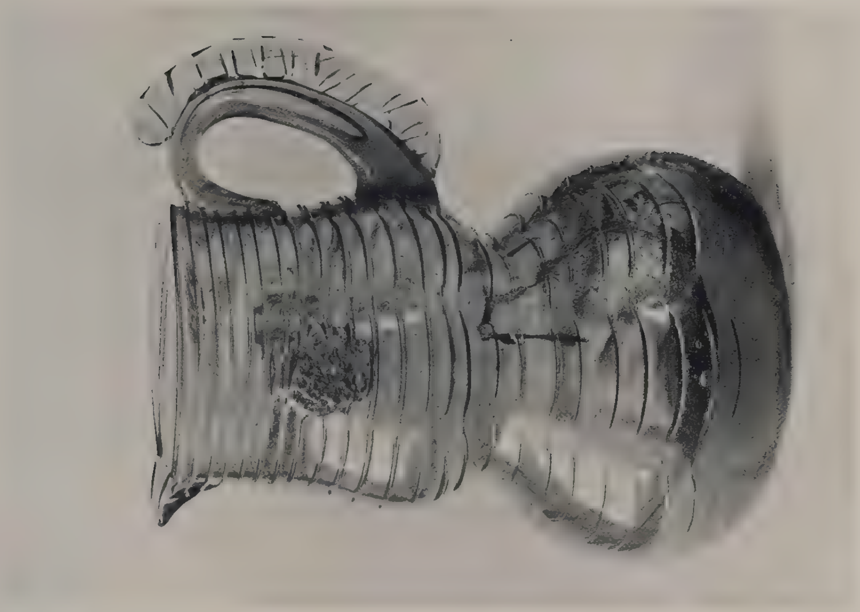

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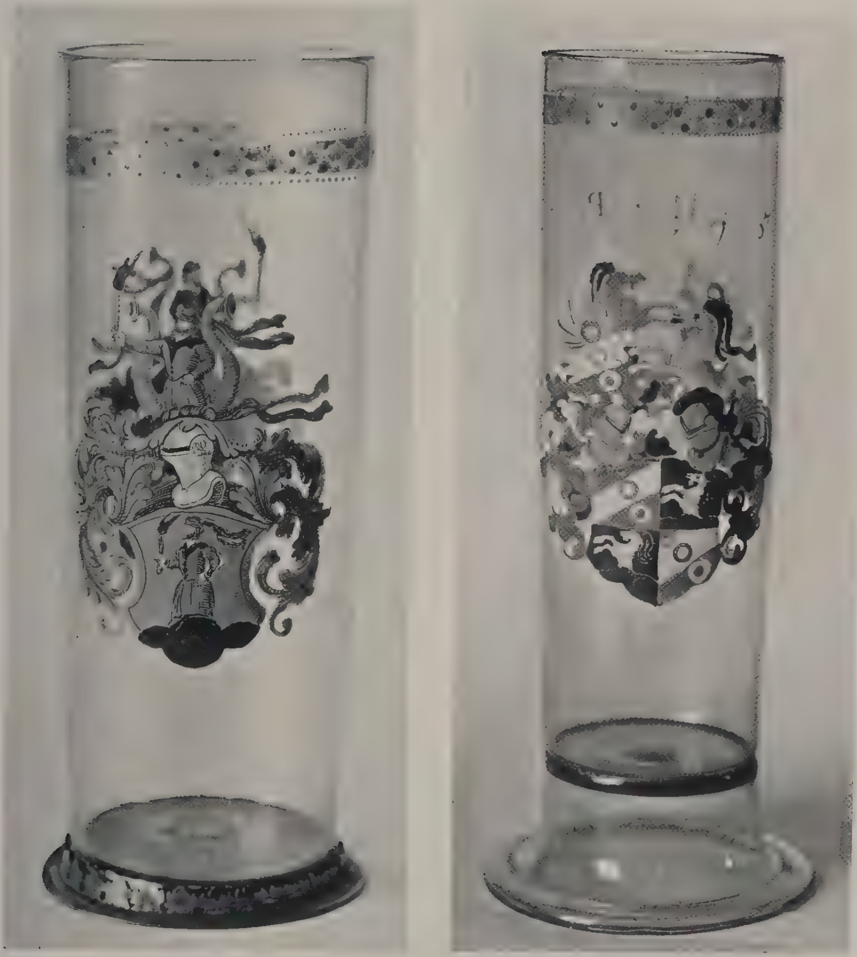

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28

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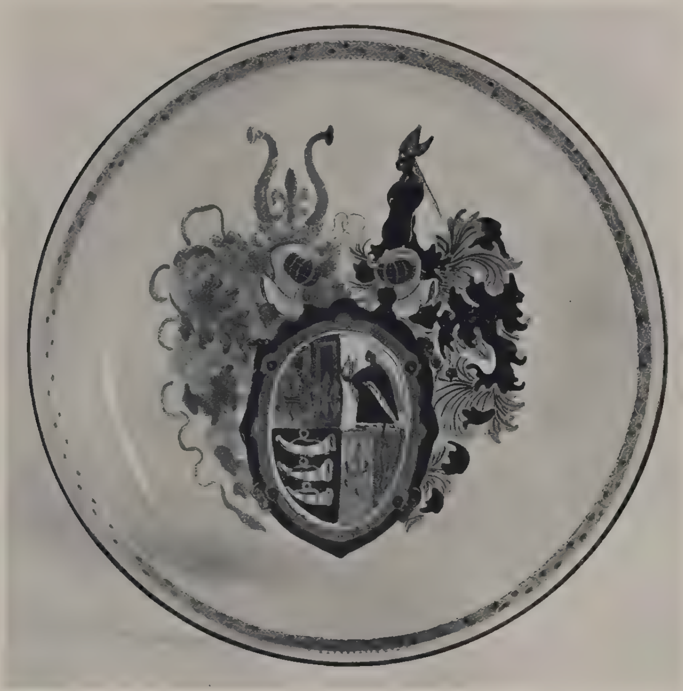

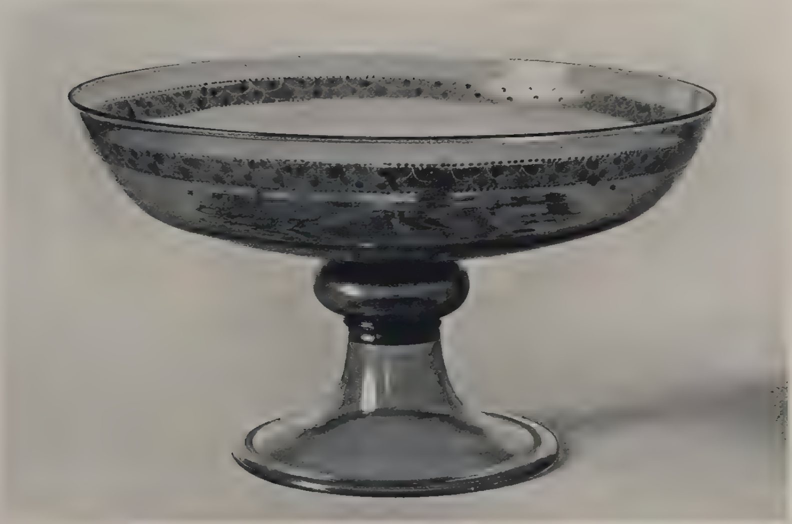

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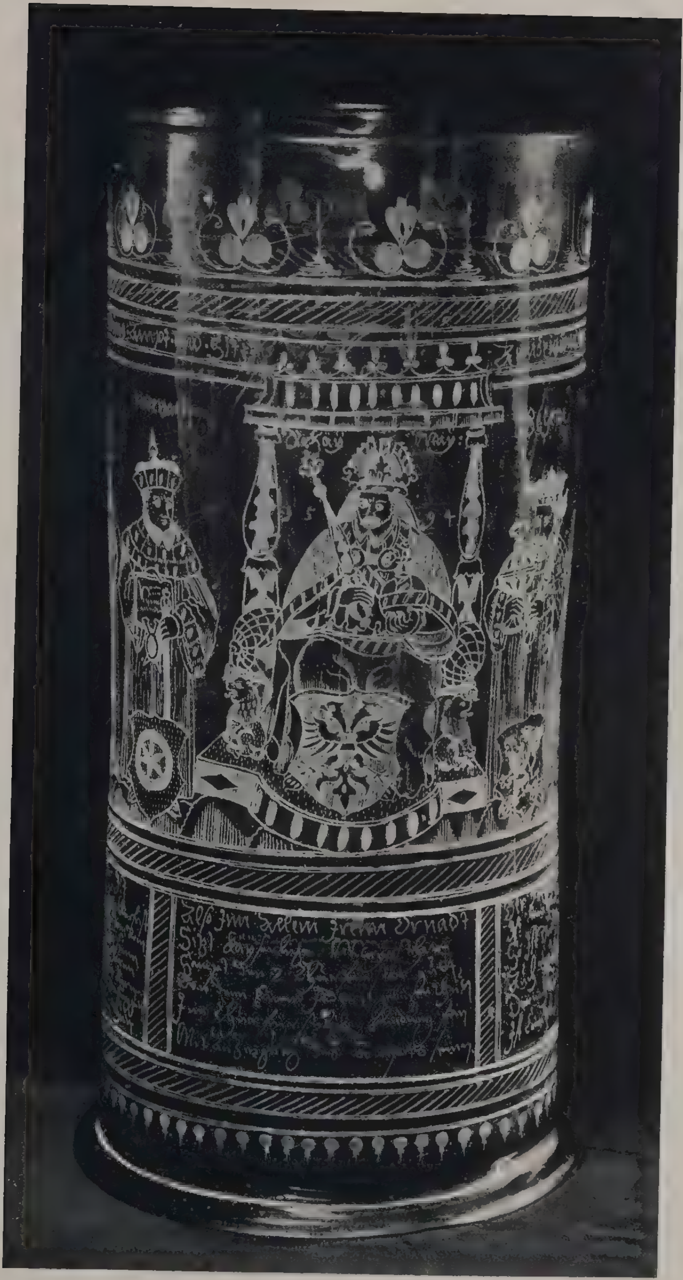

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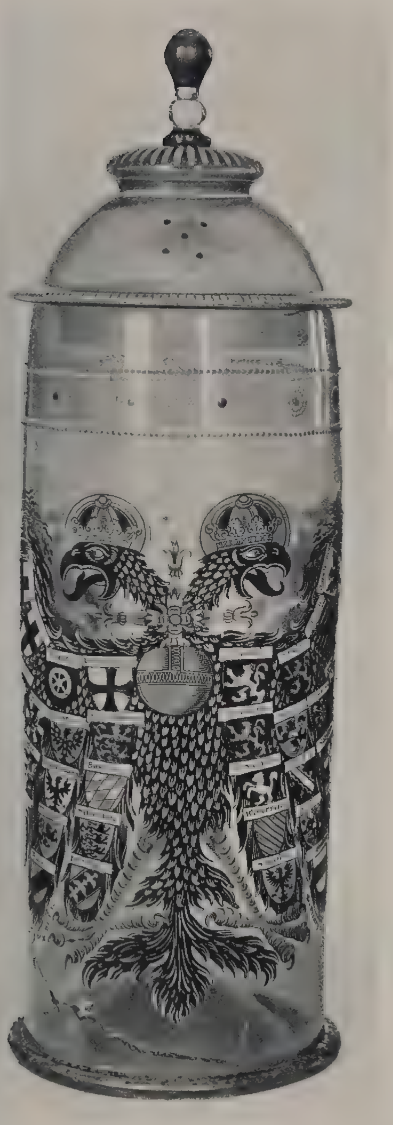

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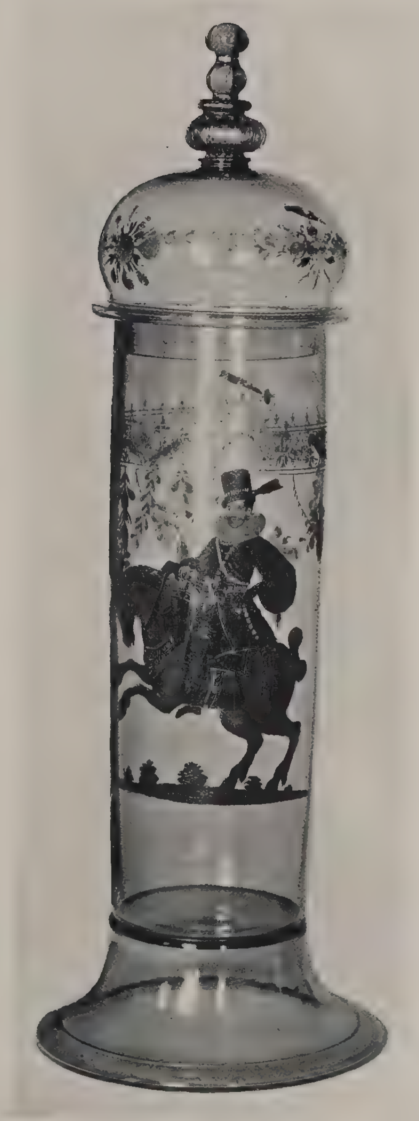

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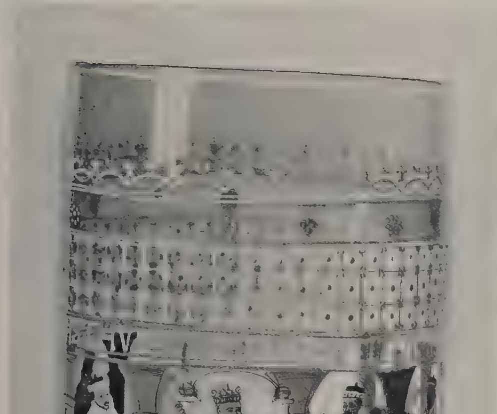

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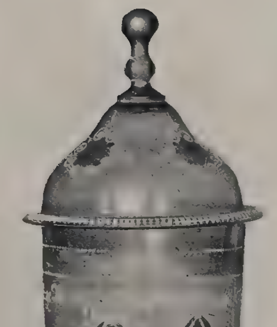

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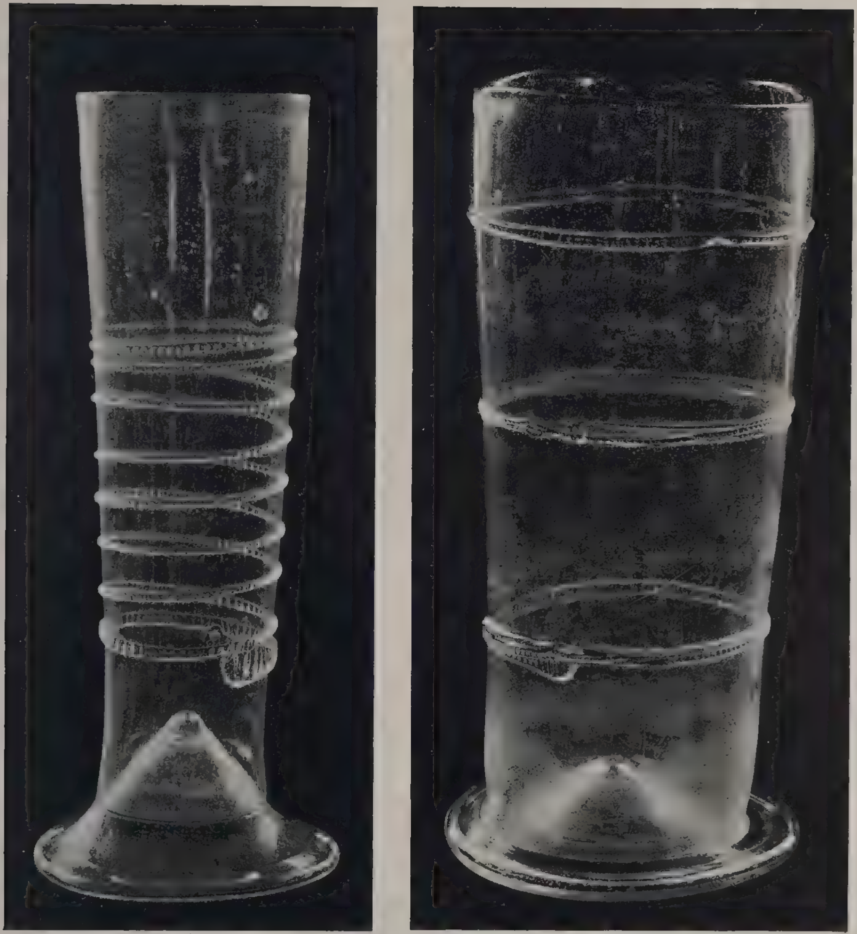

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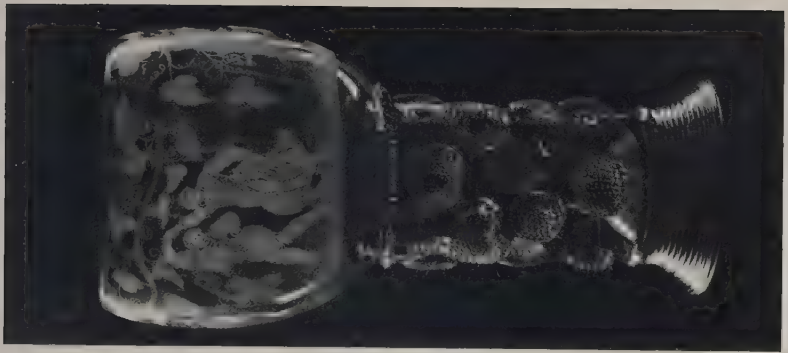

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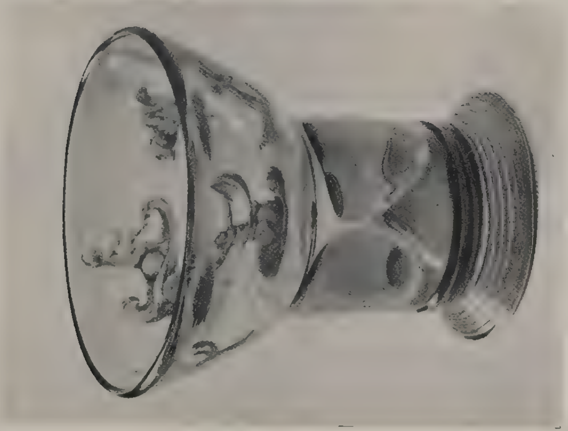

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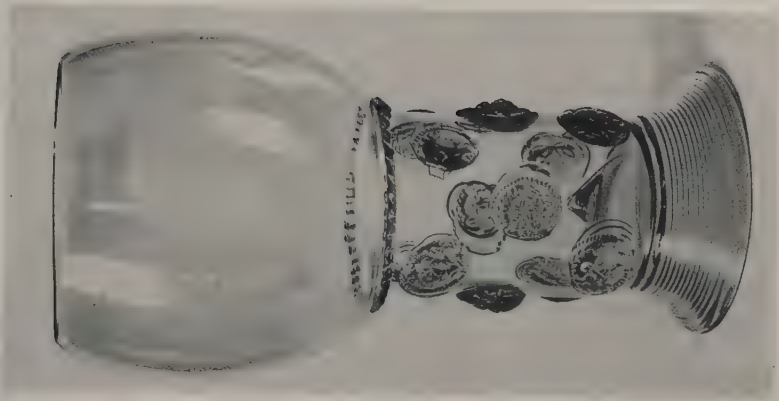

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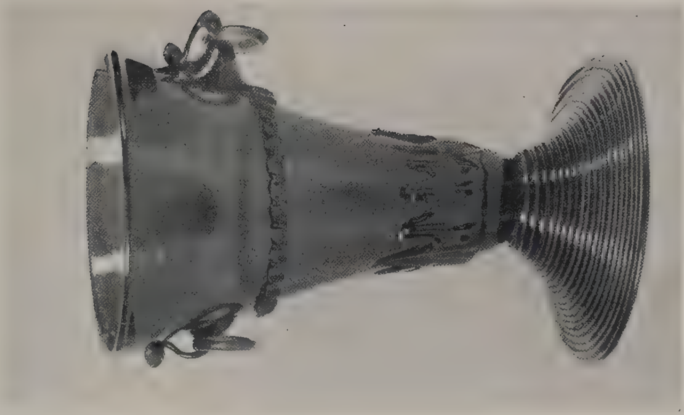

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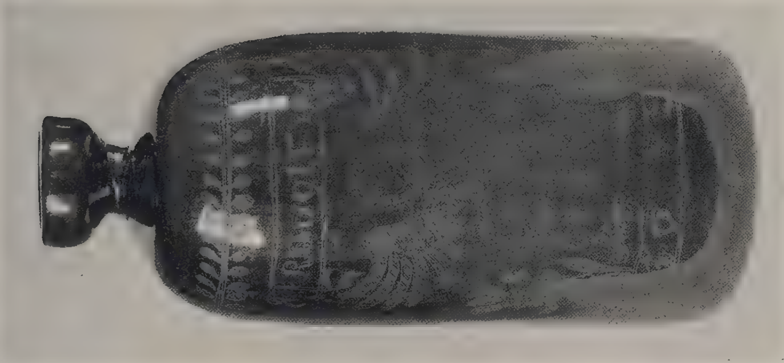

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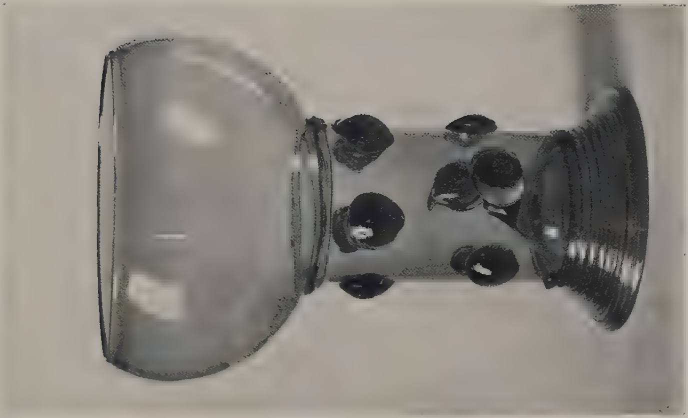

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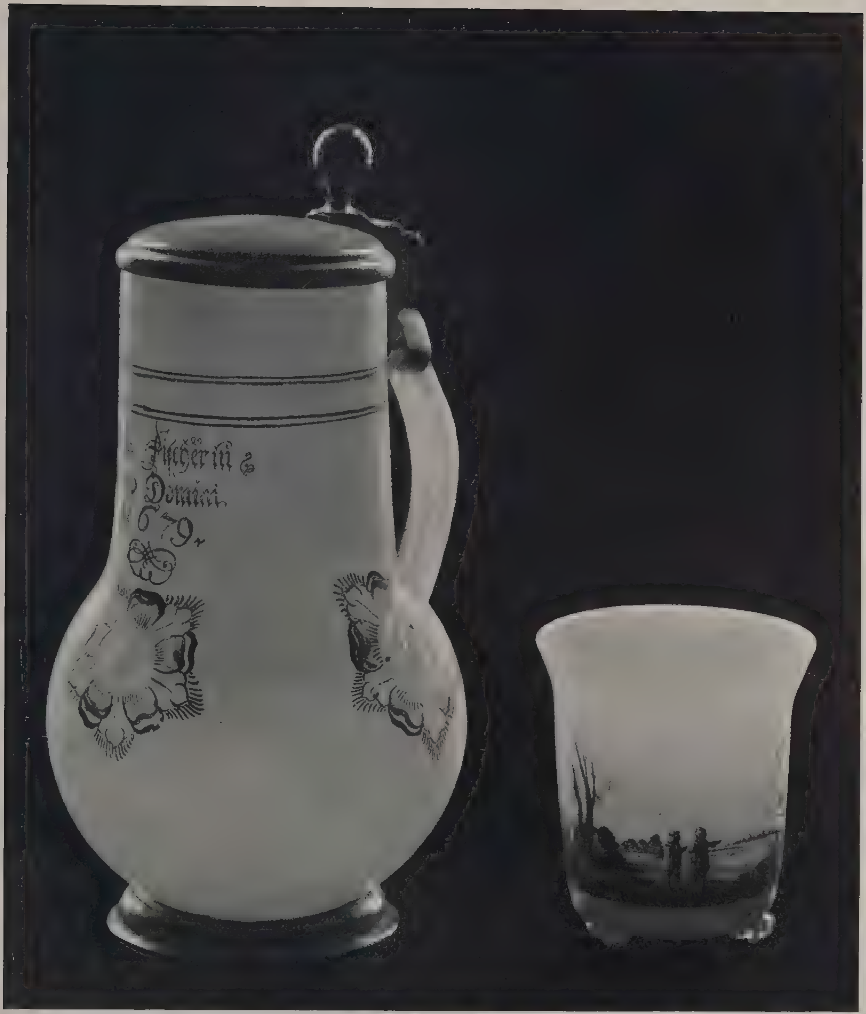
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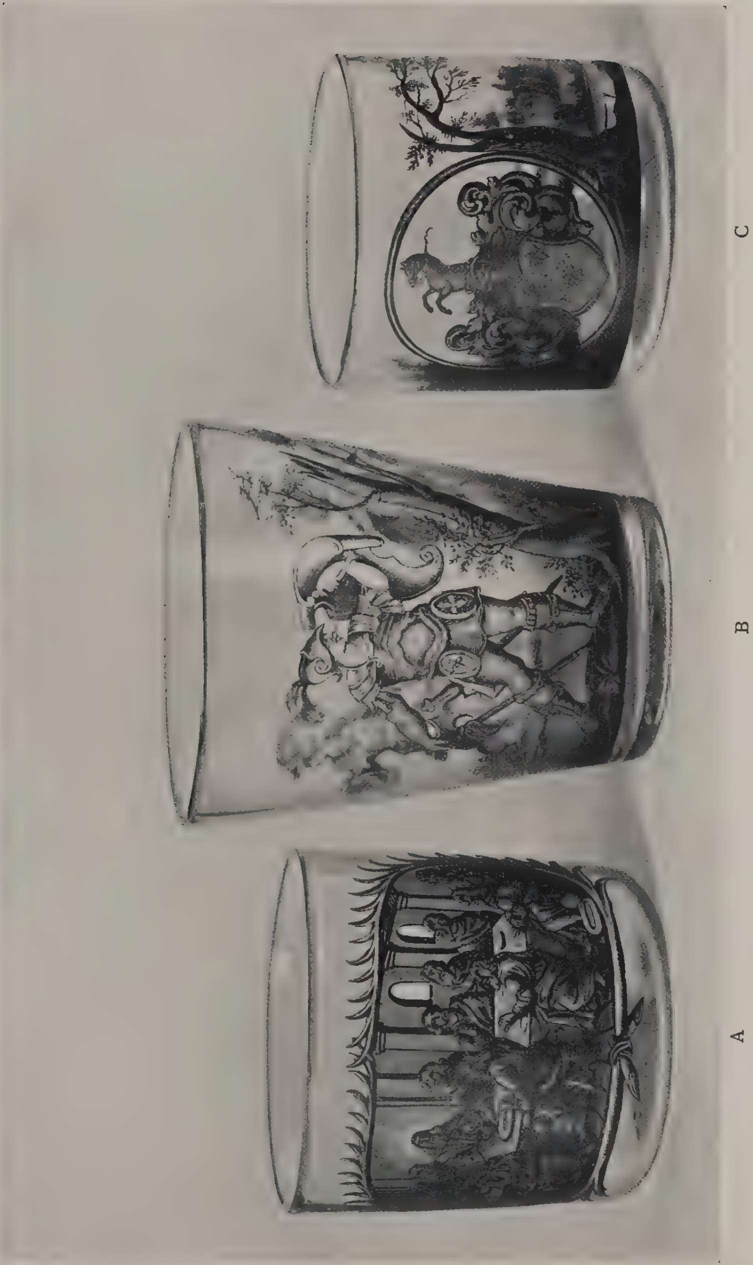

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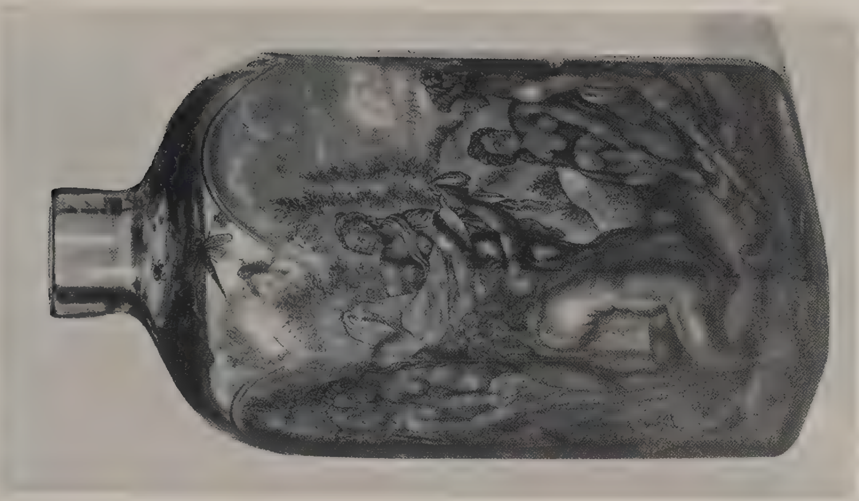

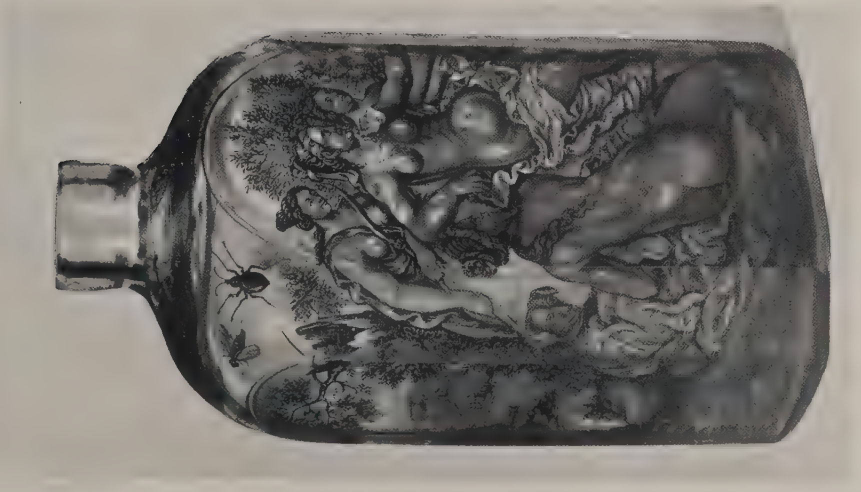

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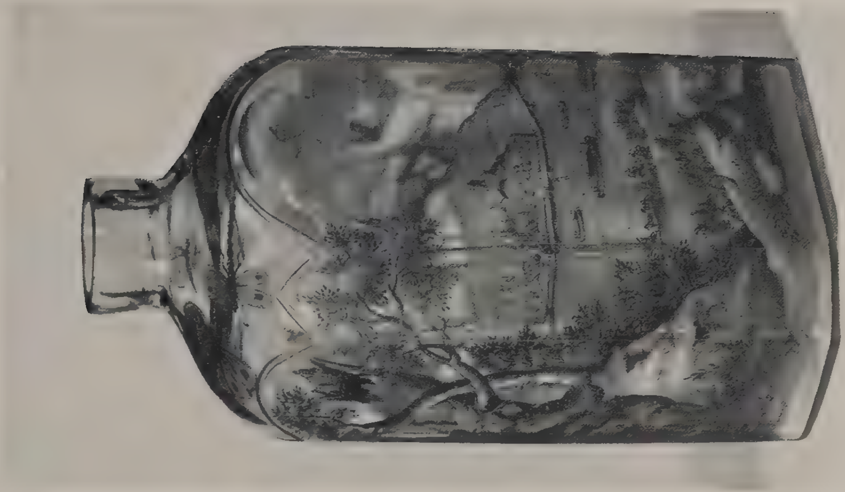

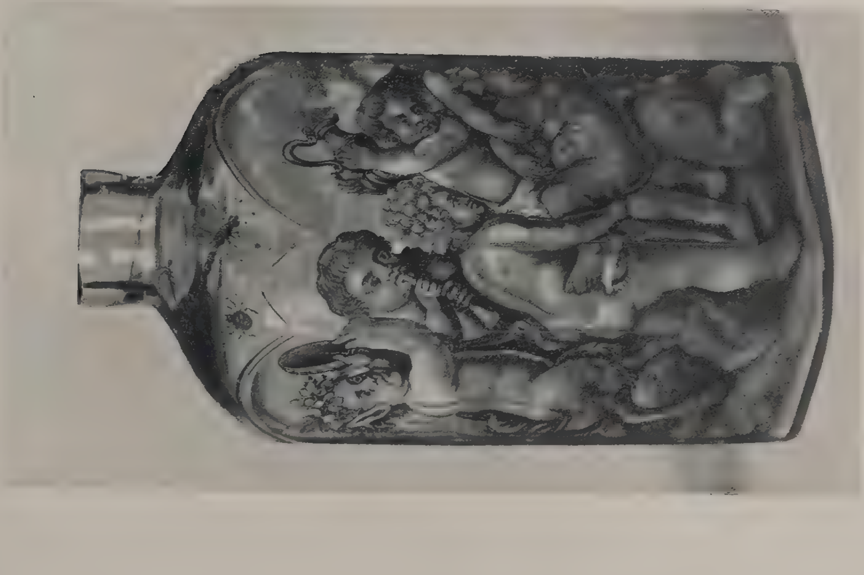

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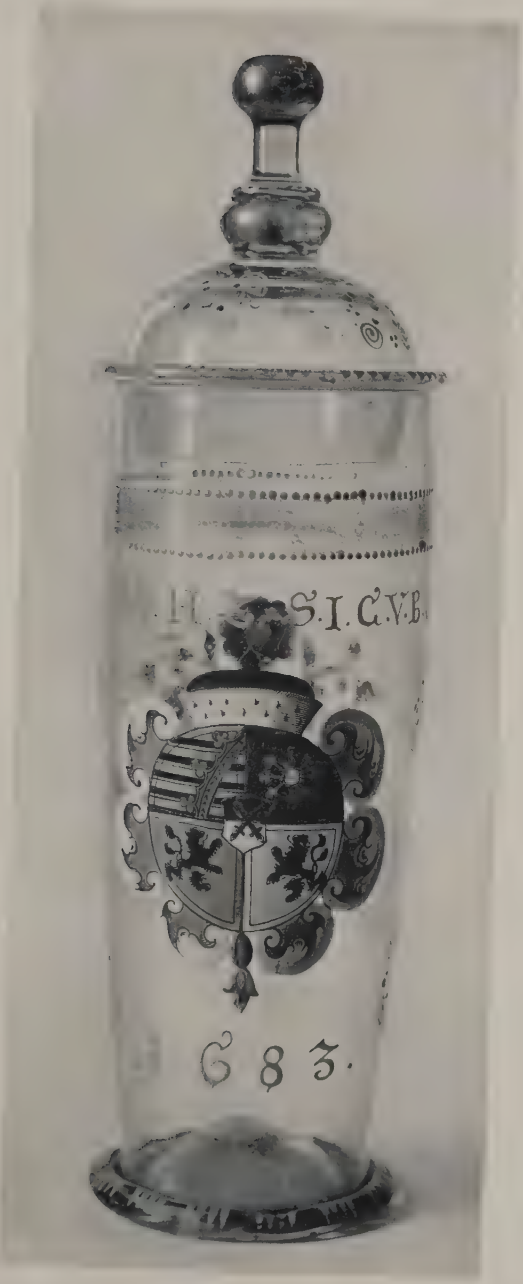

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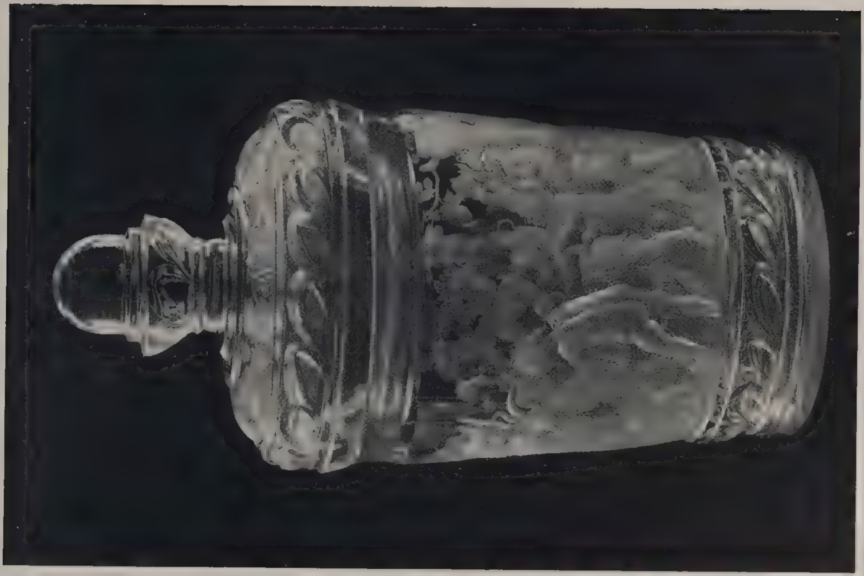

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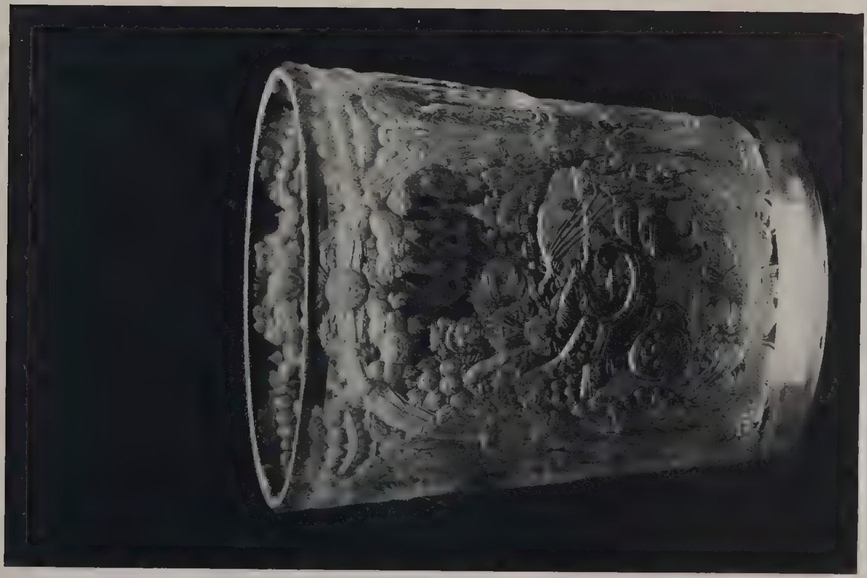

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41

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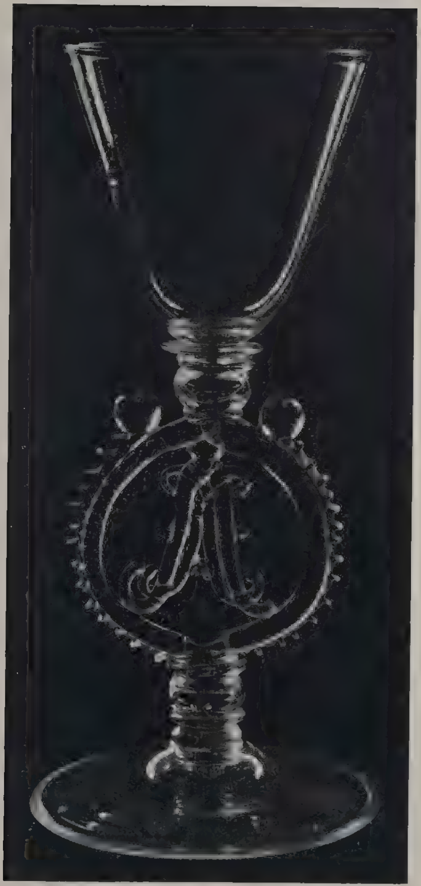

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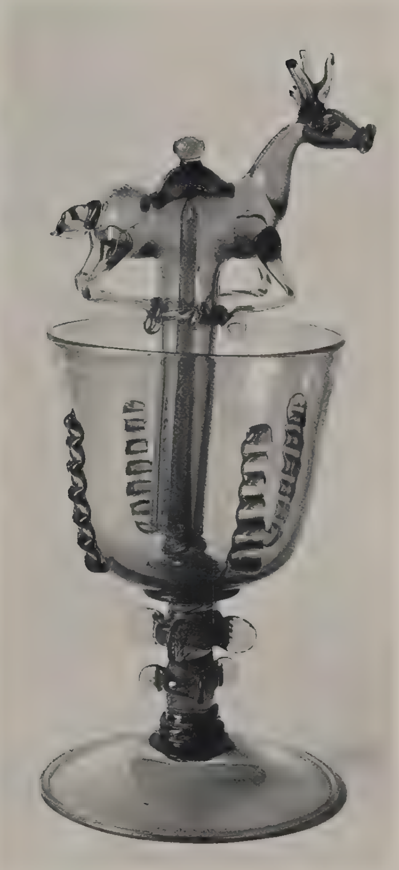

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42

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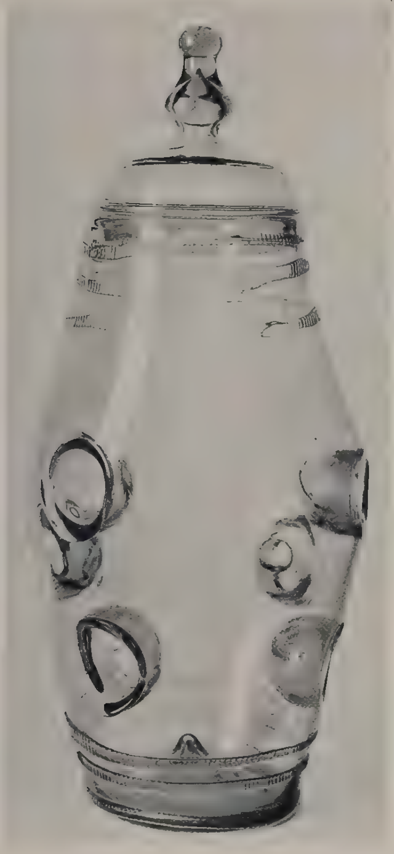

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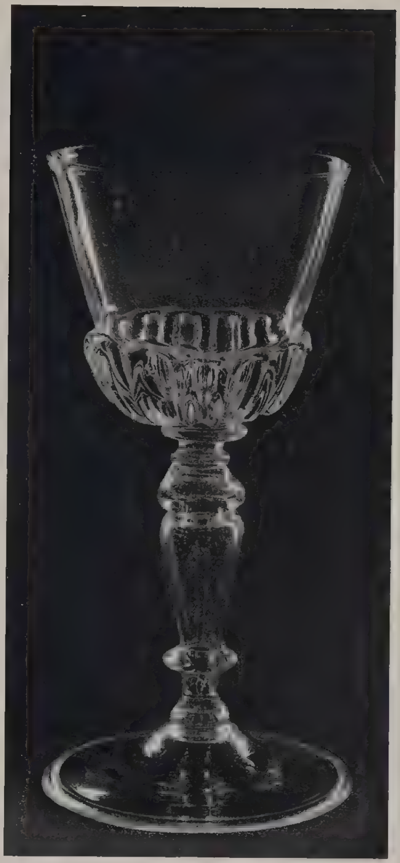

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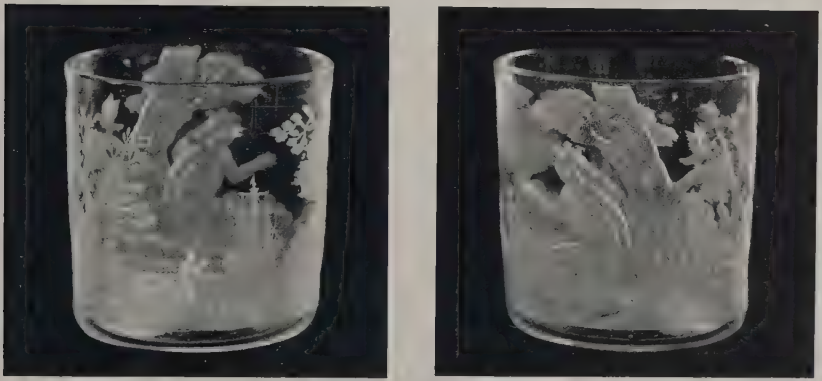

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43

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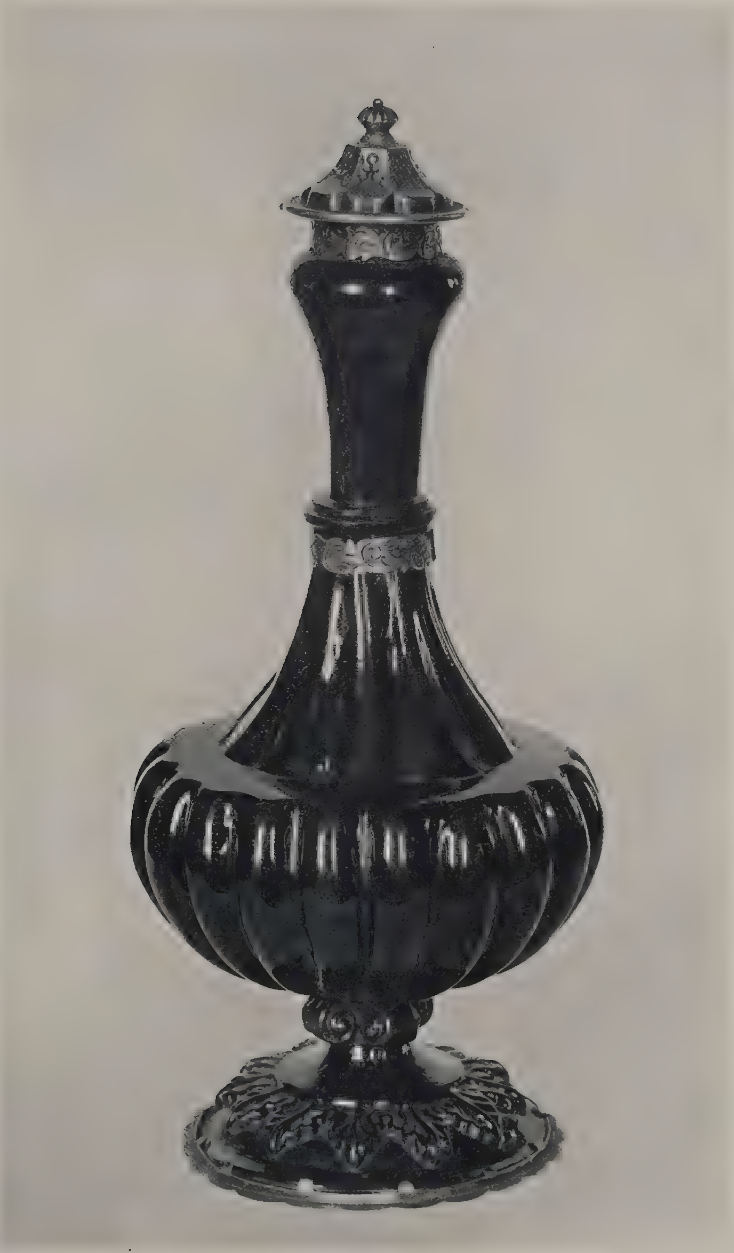

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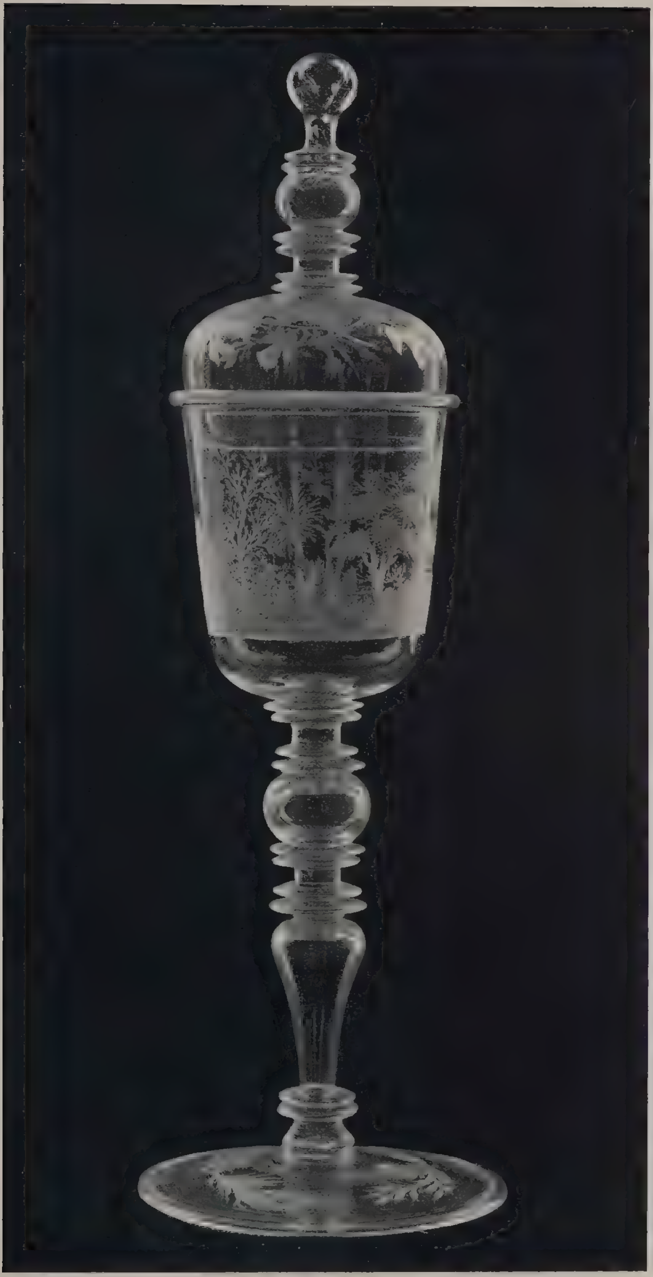

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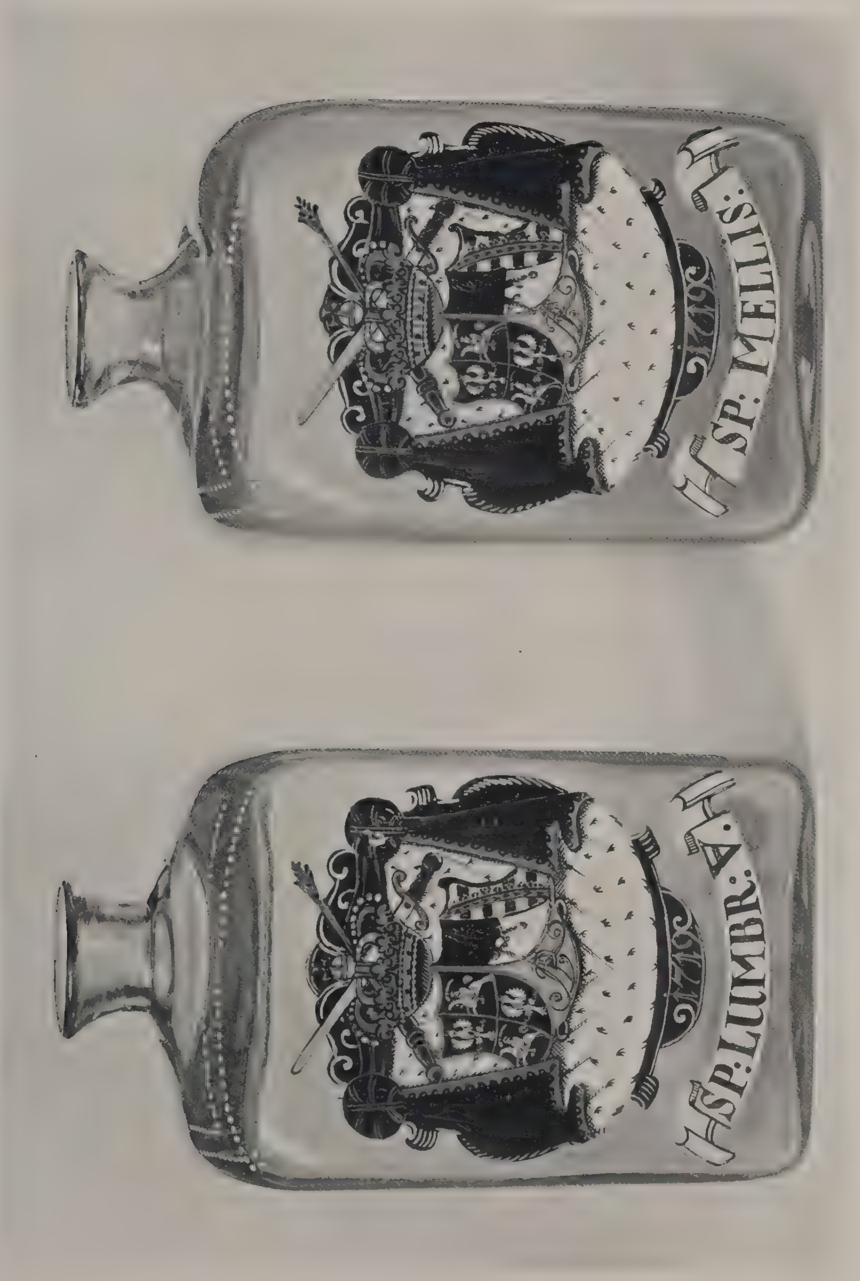
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46

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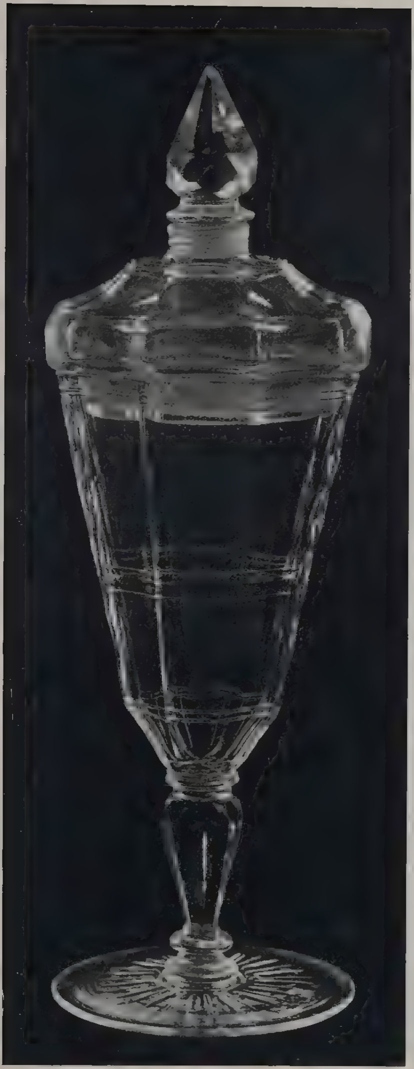

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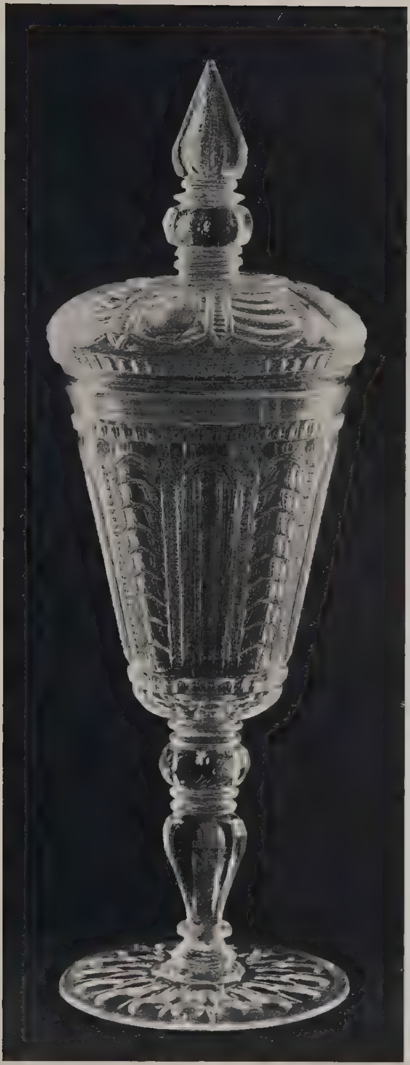

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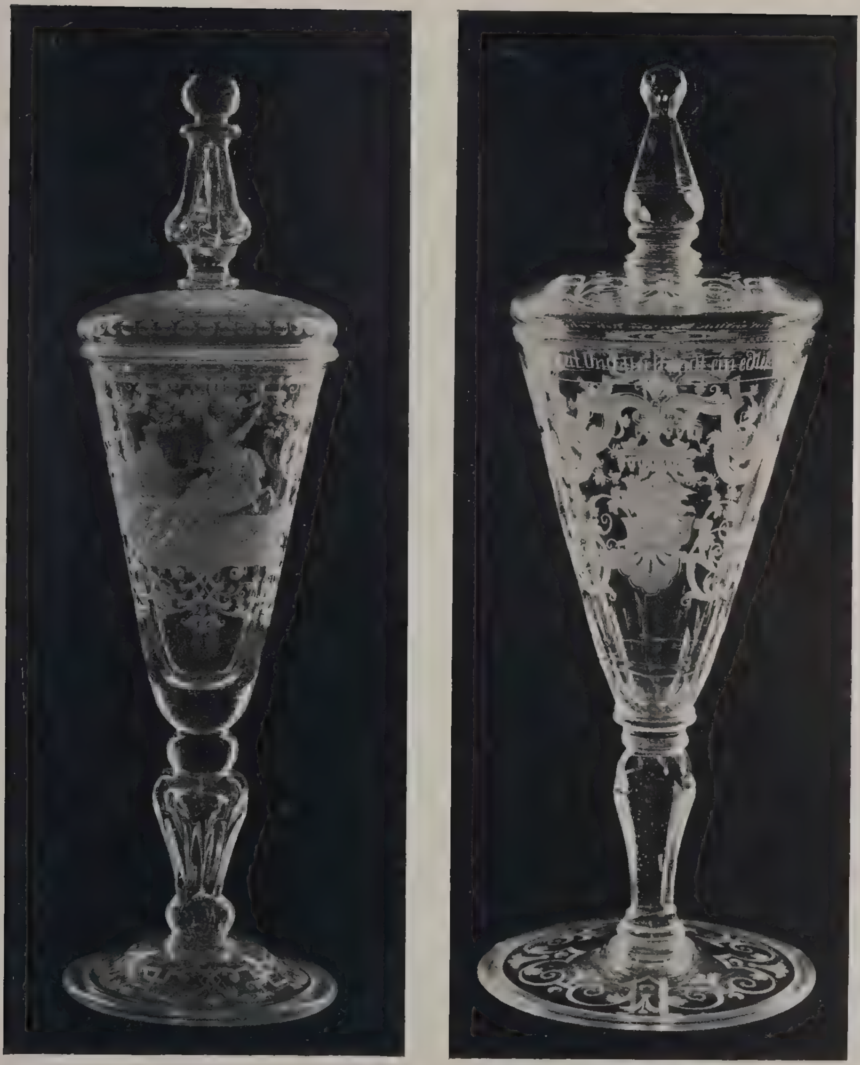
47

GERMAN GLASS



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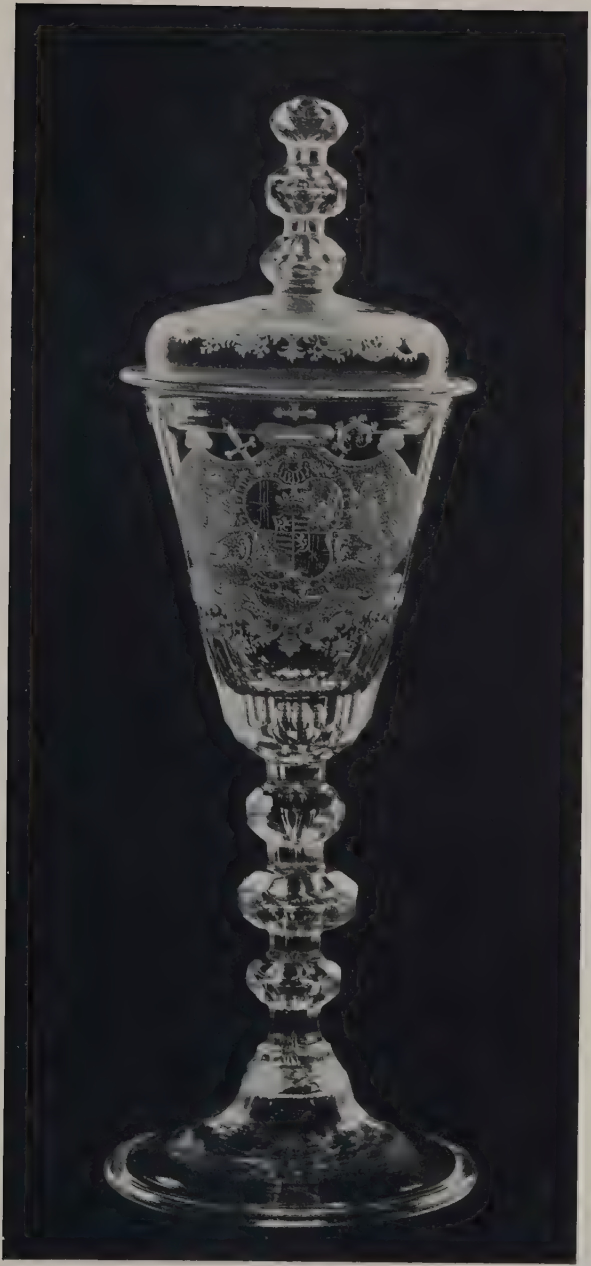
B

48

GERMAN GLASS



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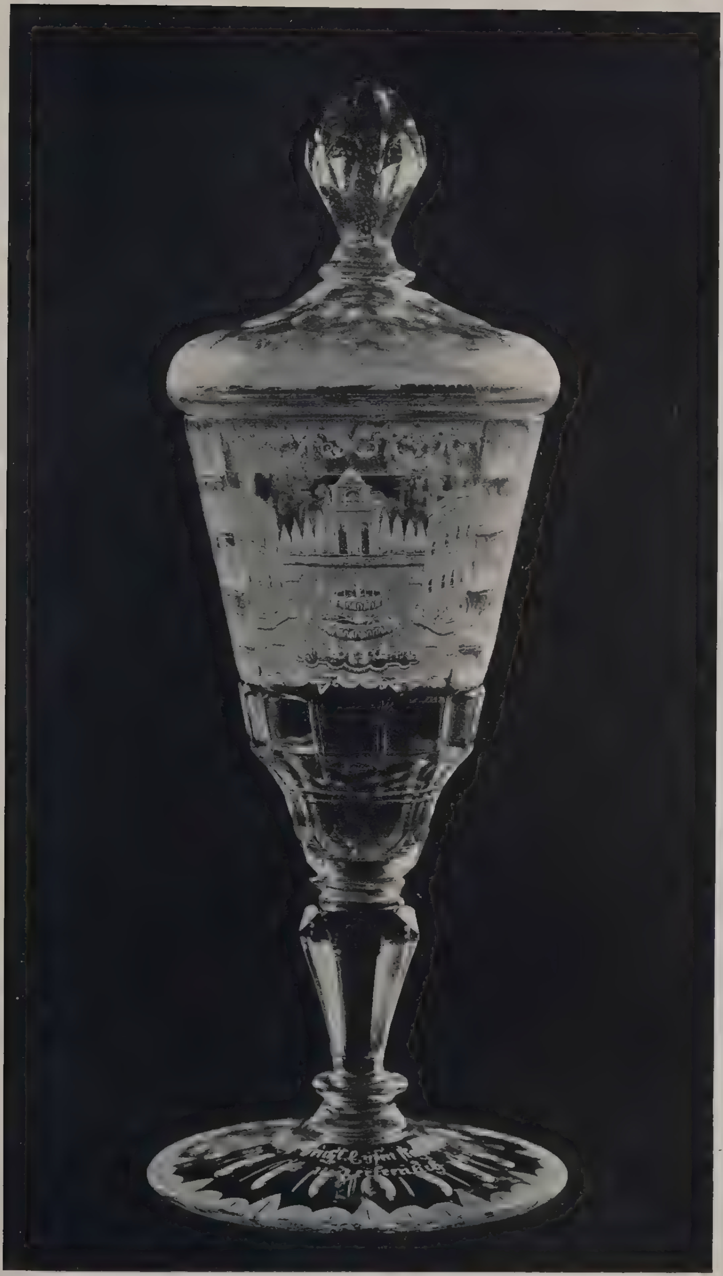

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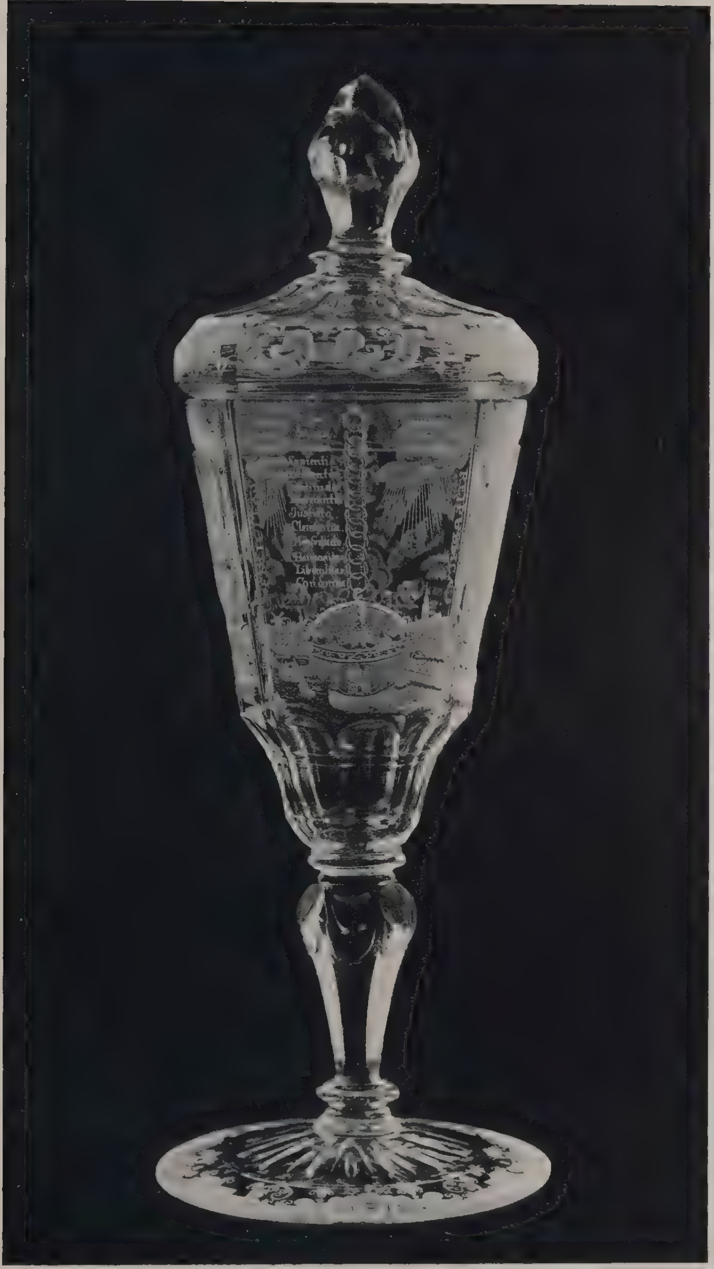

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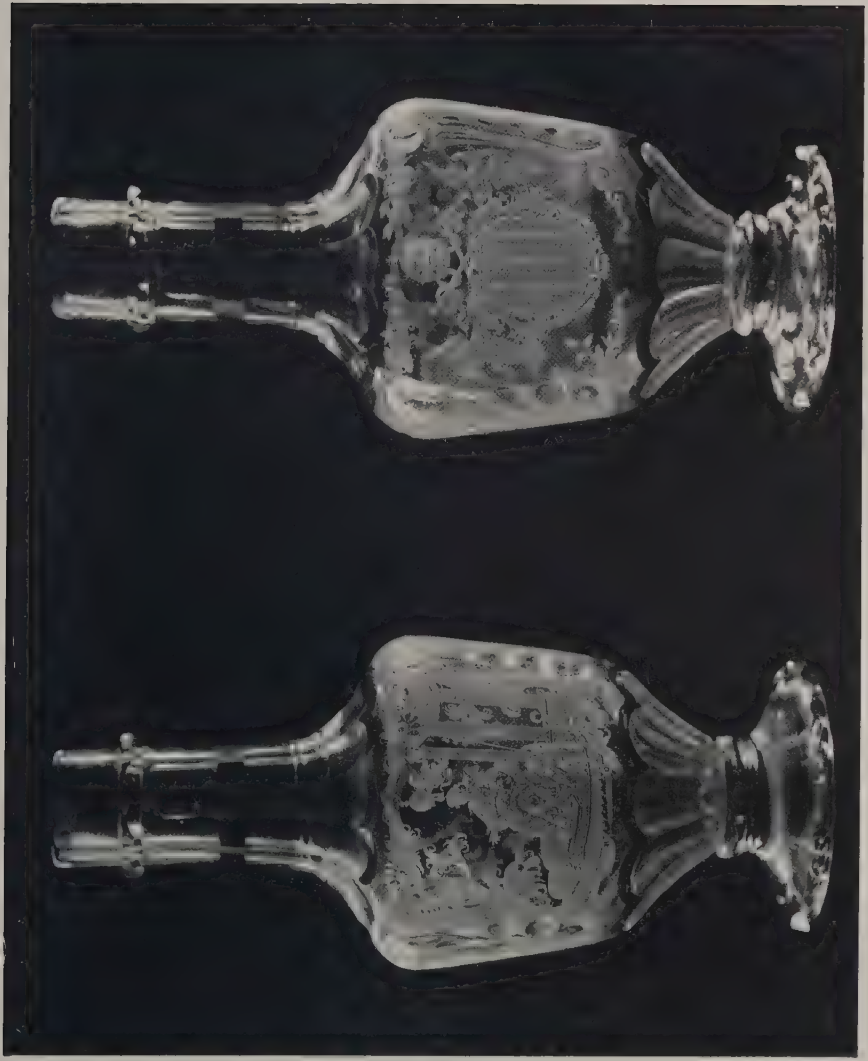

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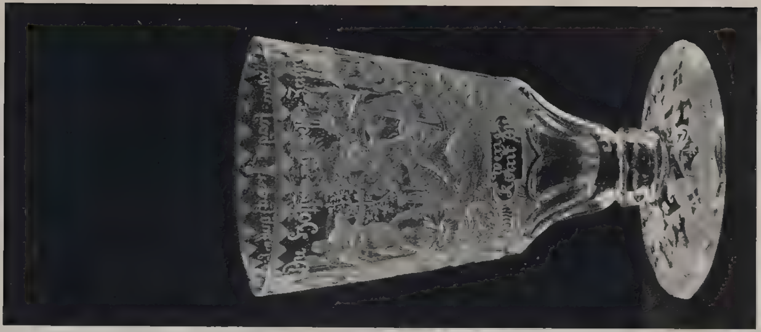

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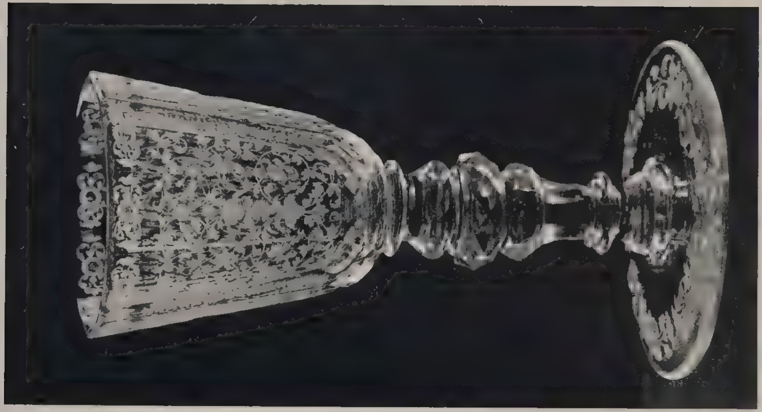

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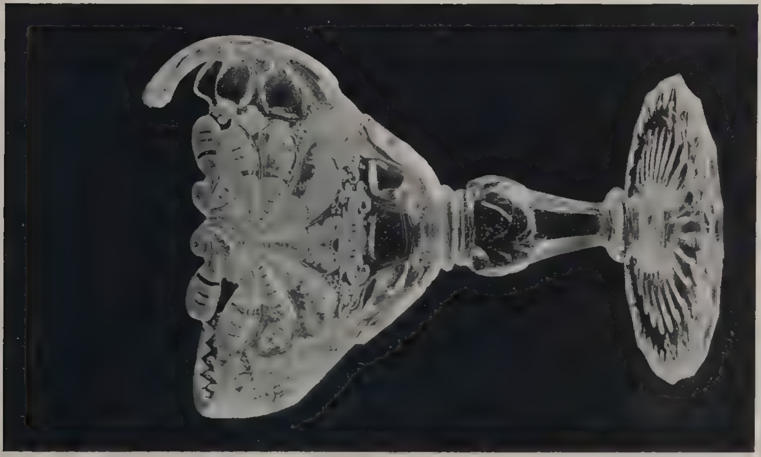

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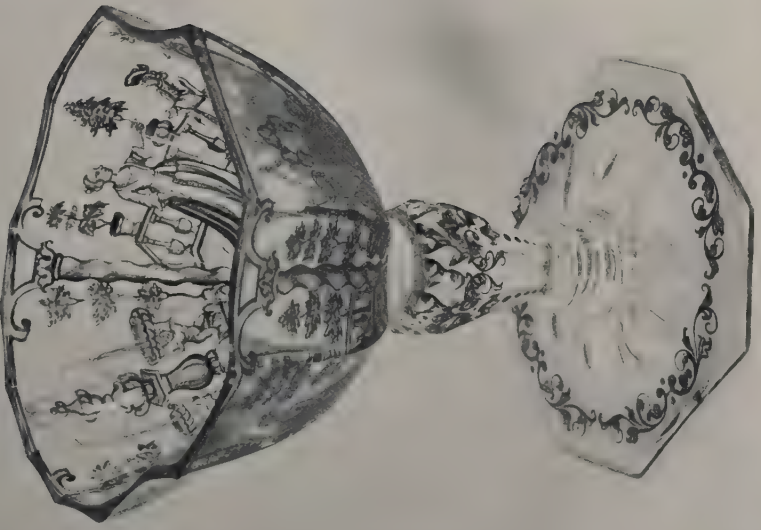

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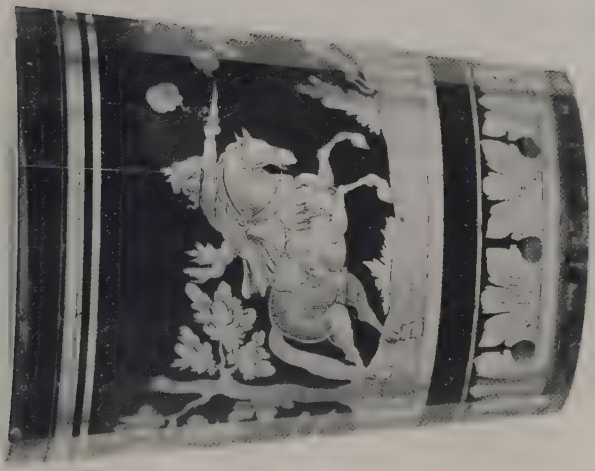

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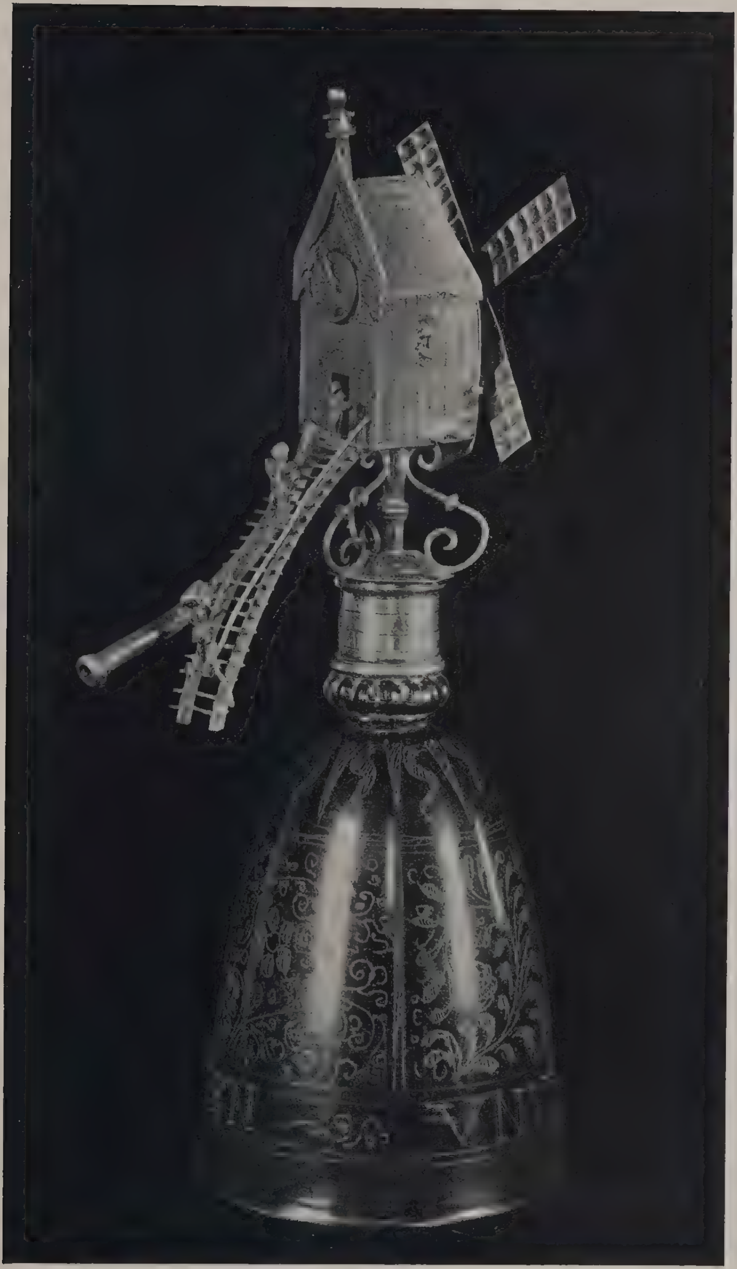

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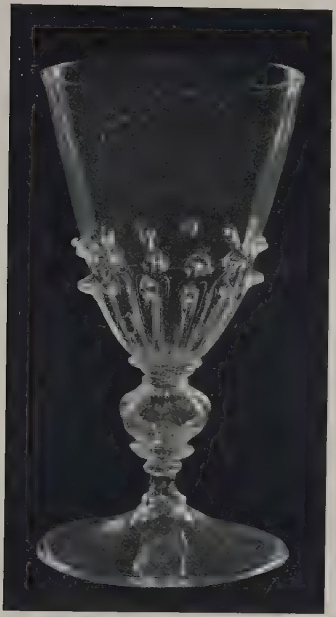
GLASS OF THE LOW COUNTRIES



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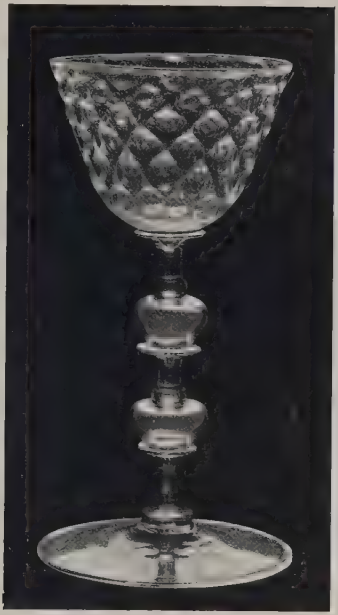

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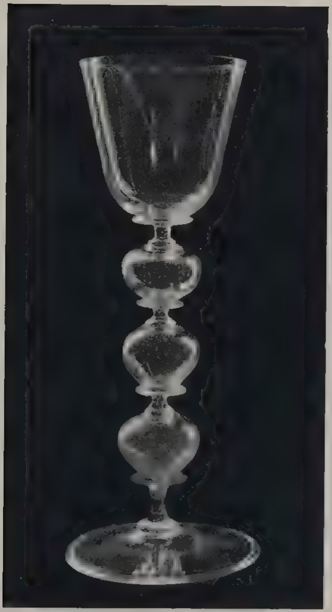

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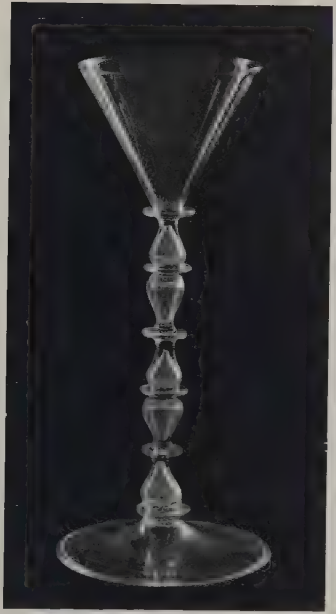

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56

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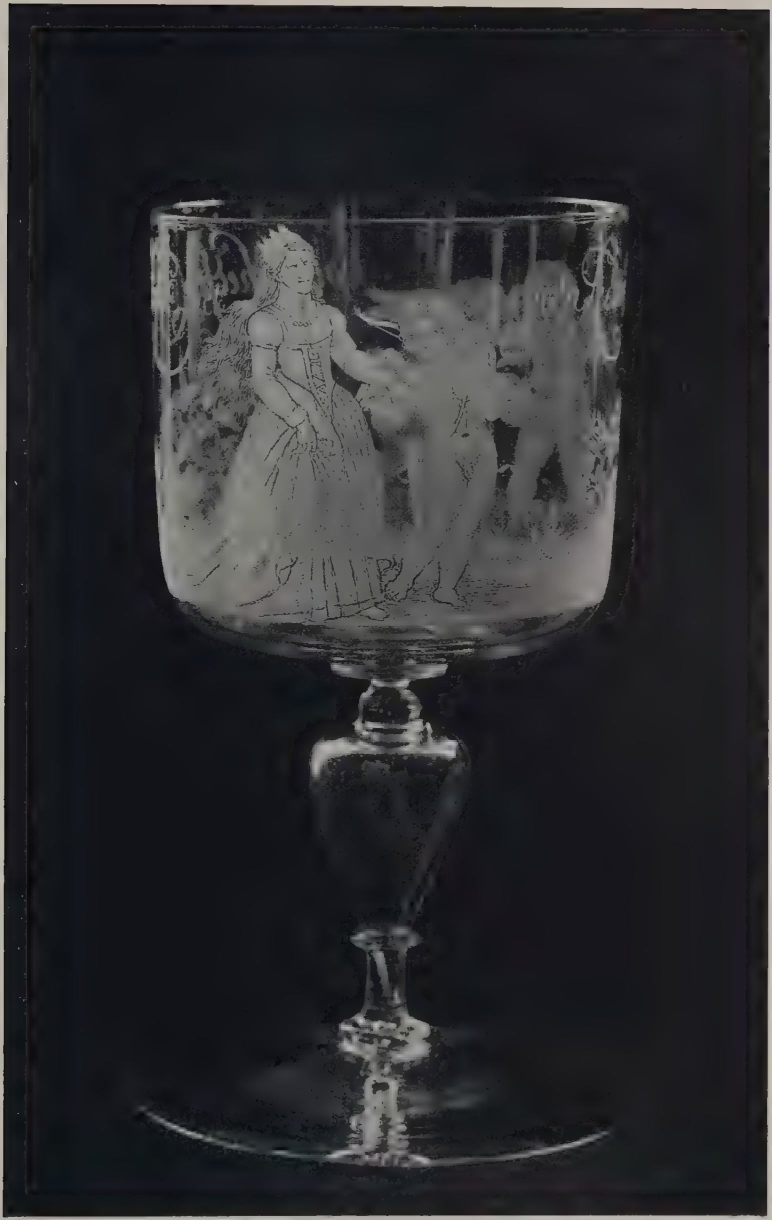

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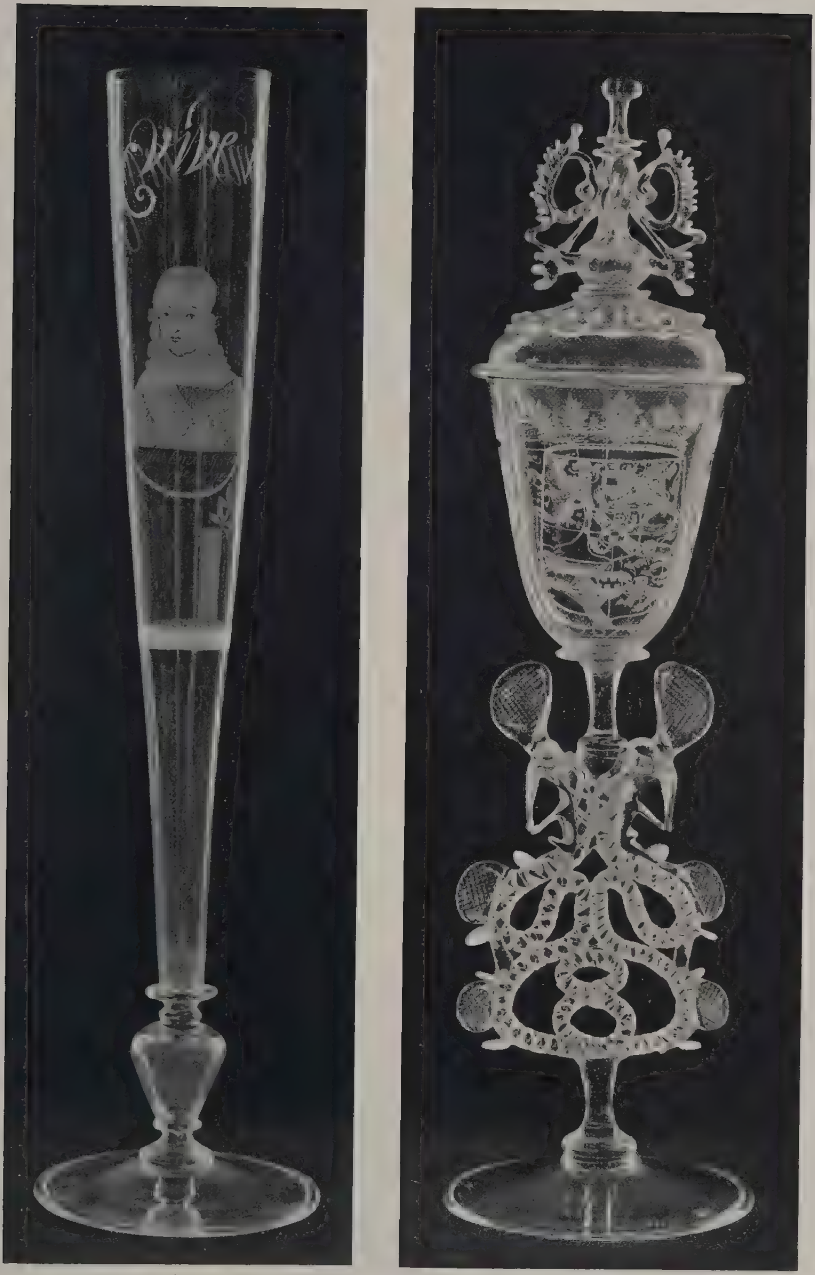

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58

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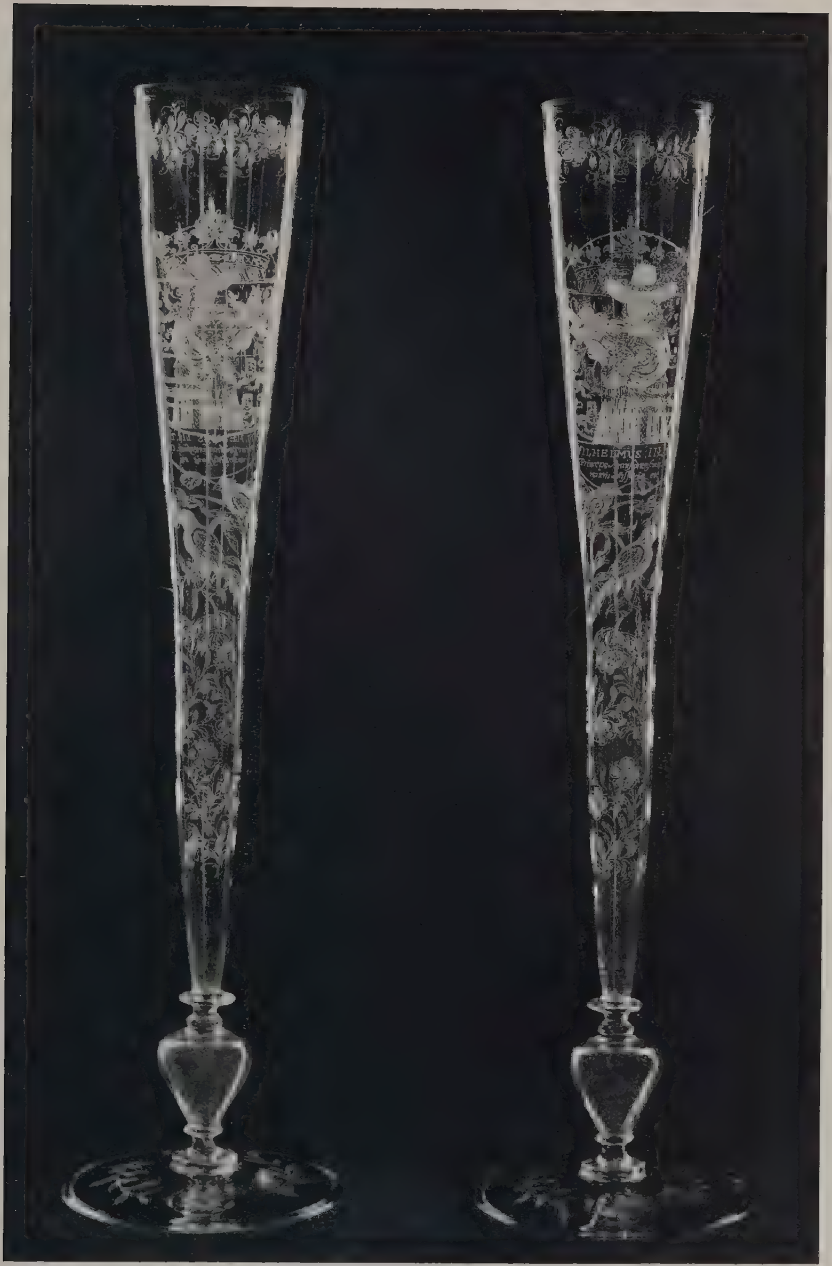

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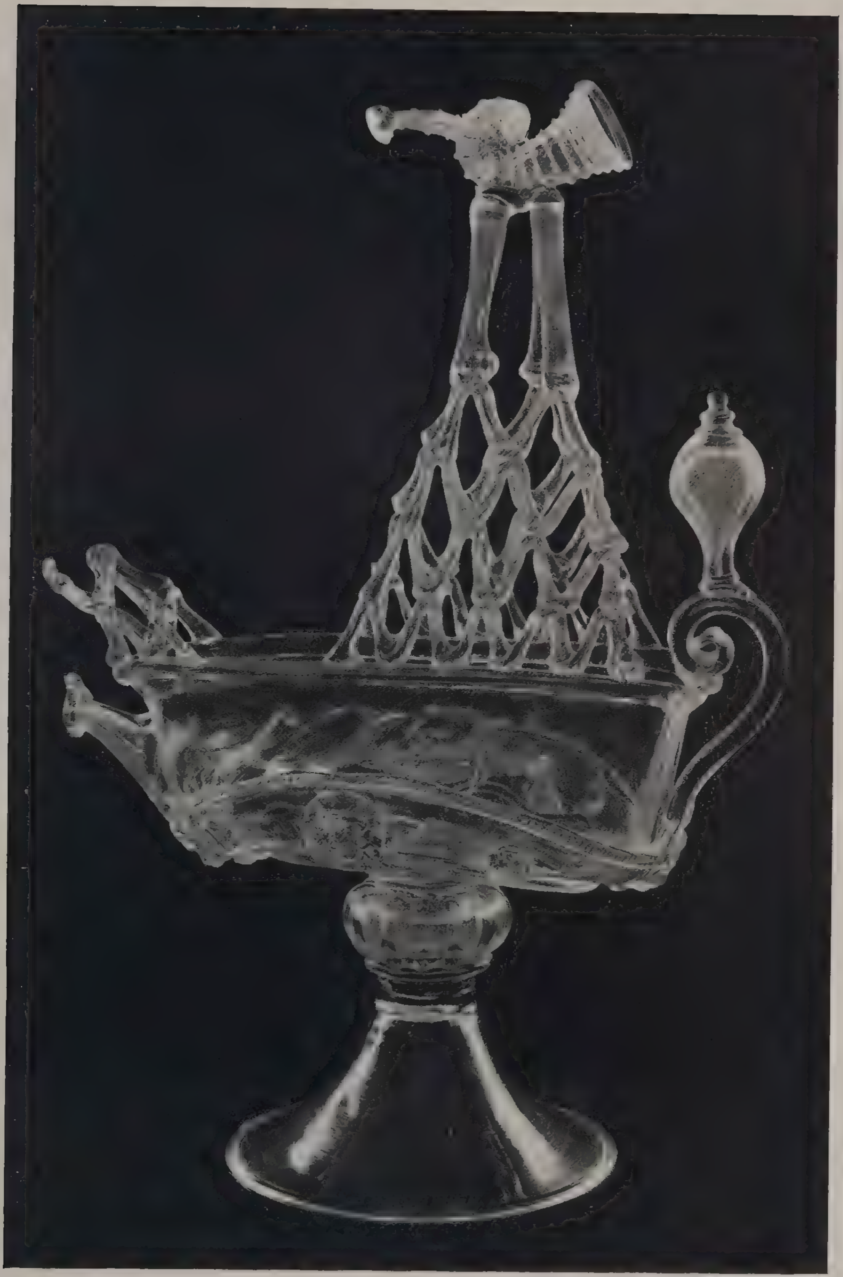

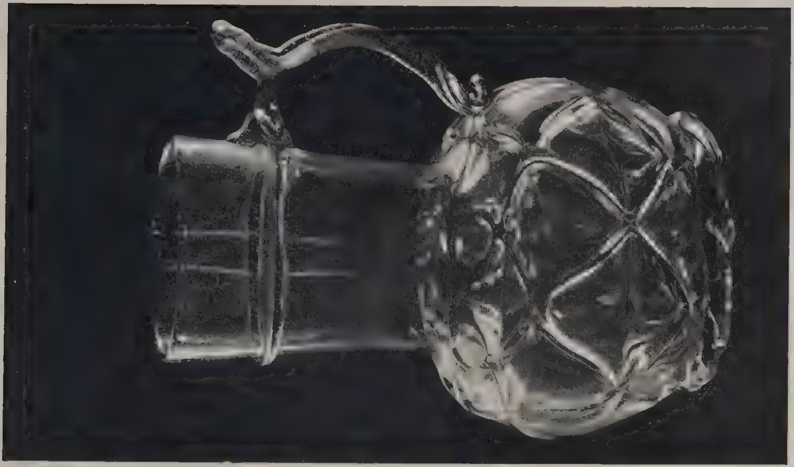

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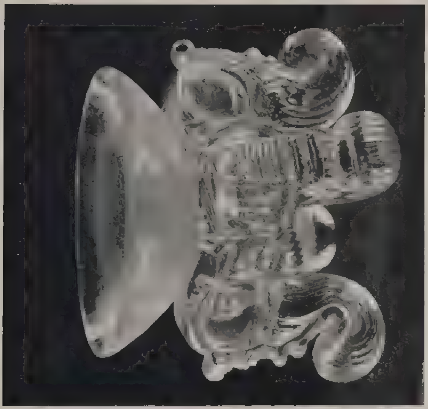

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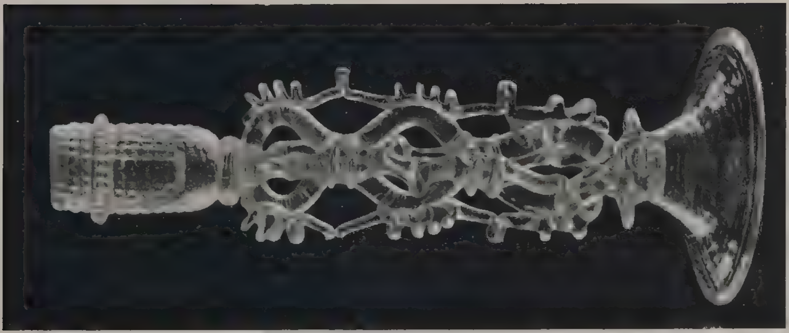

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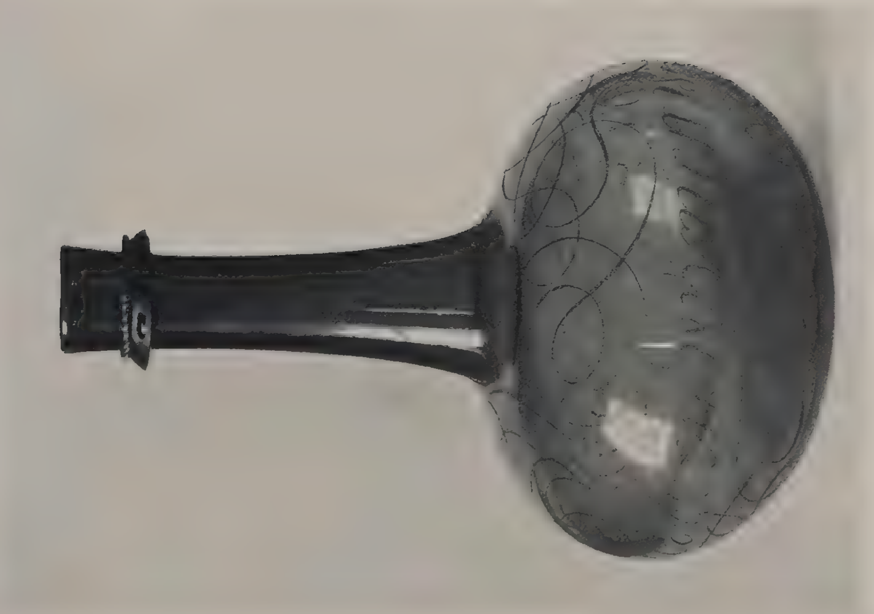

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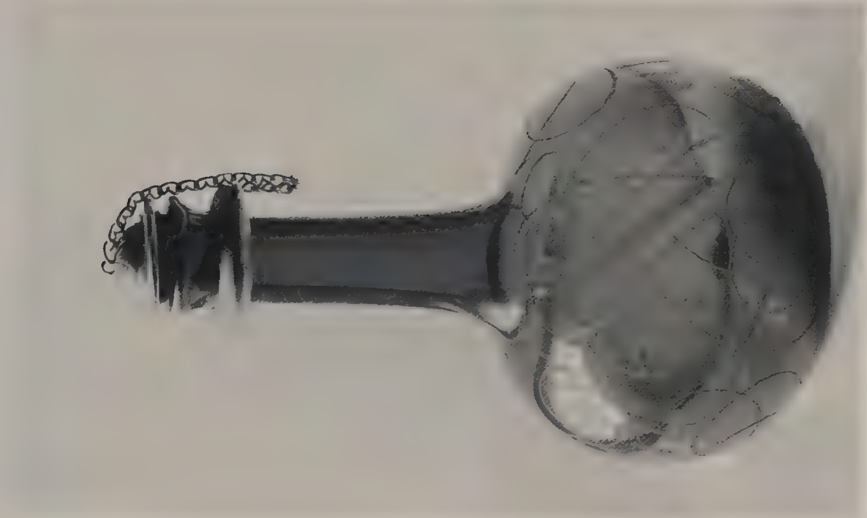

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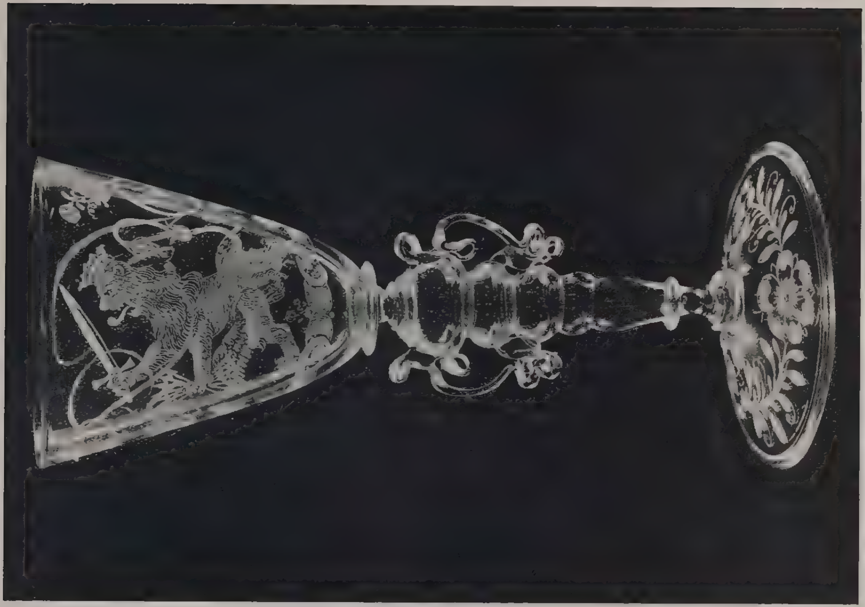

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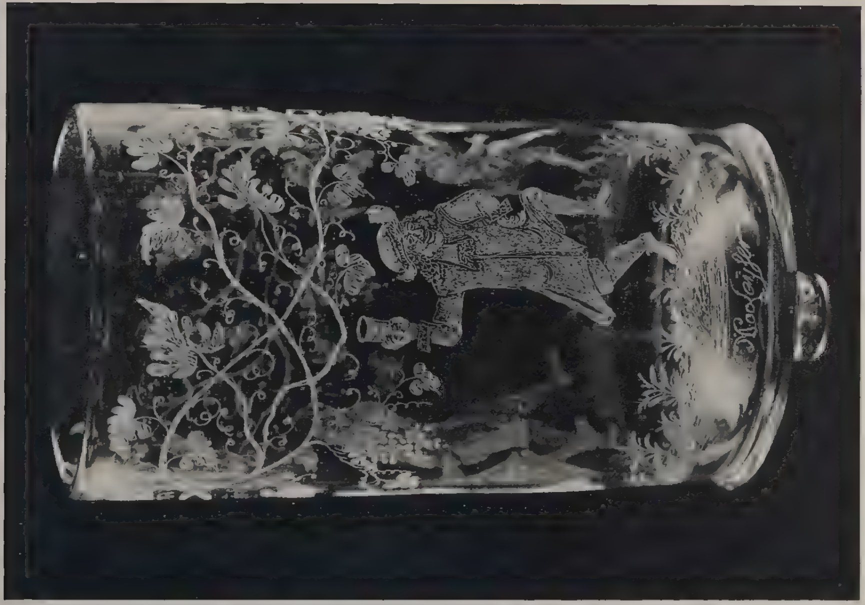

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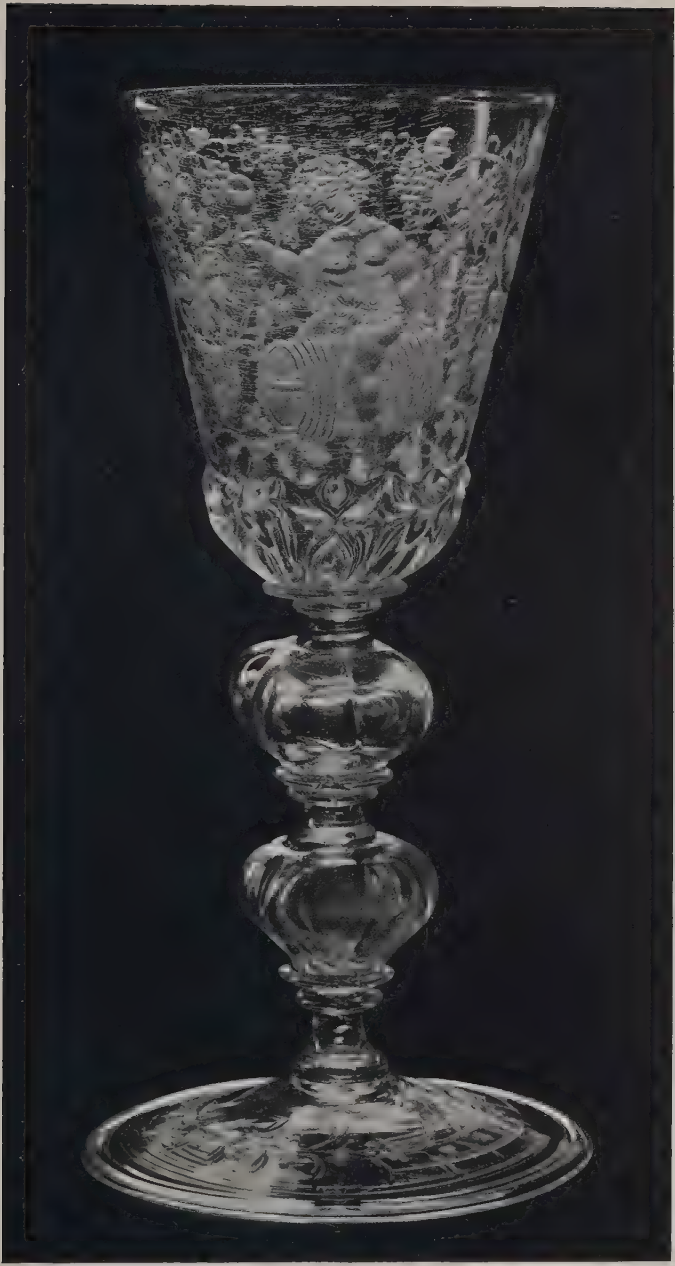

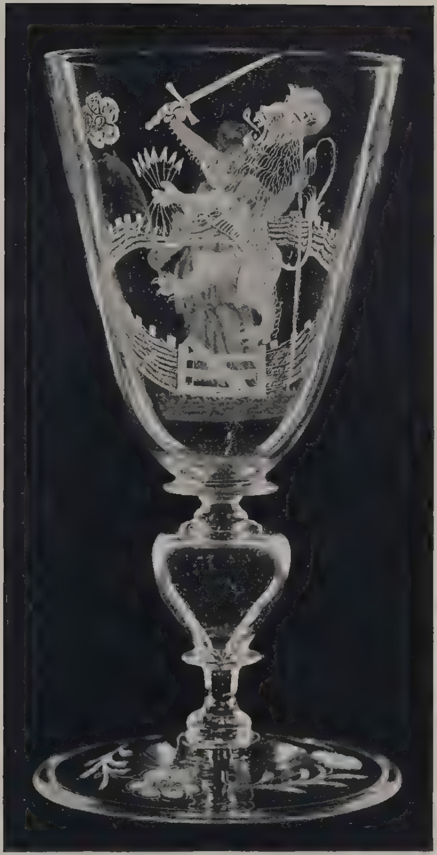

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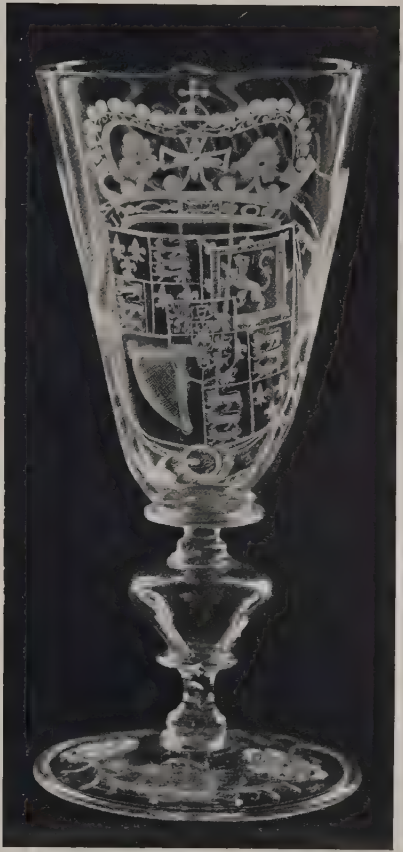

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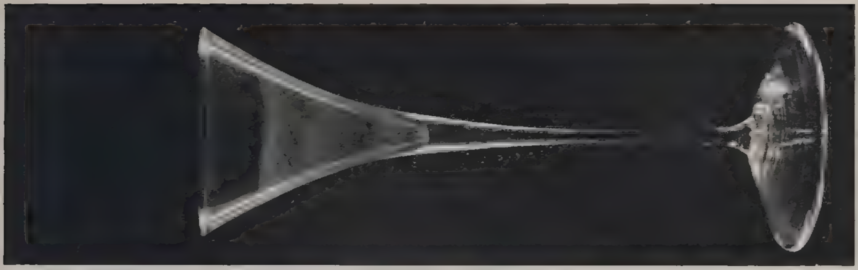

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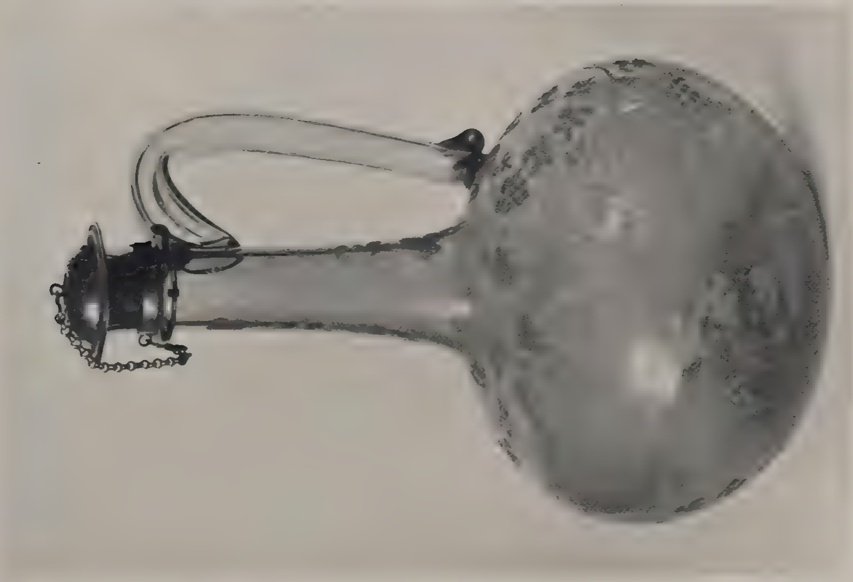

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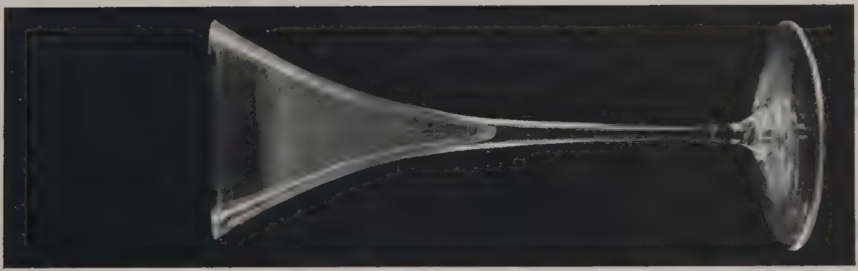

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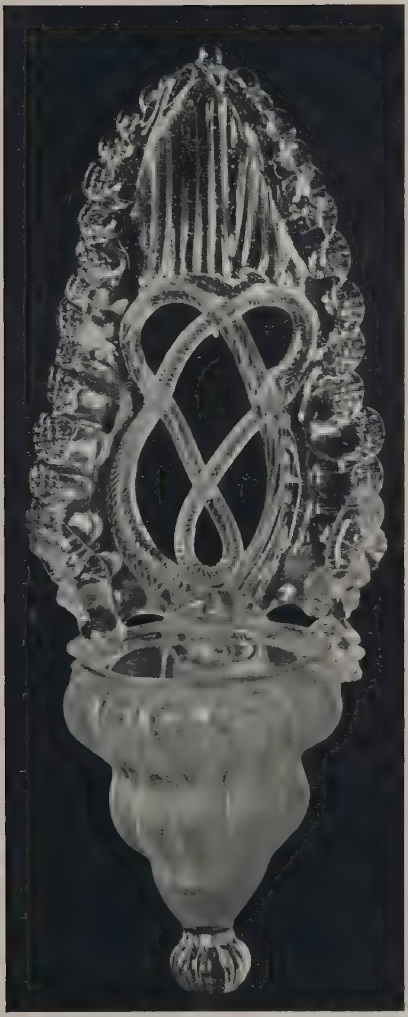

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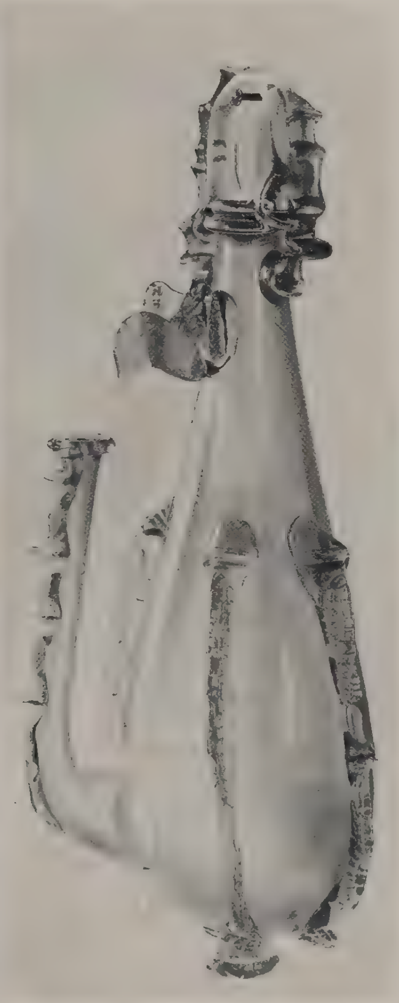

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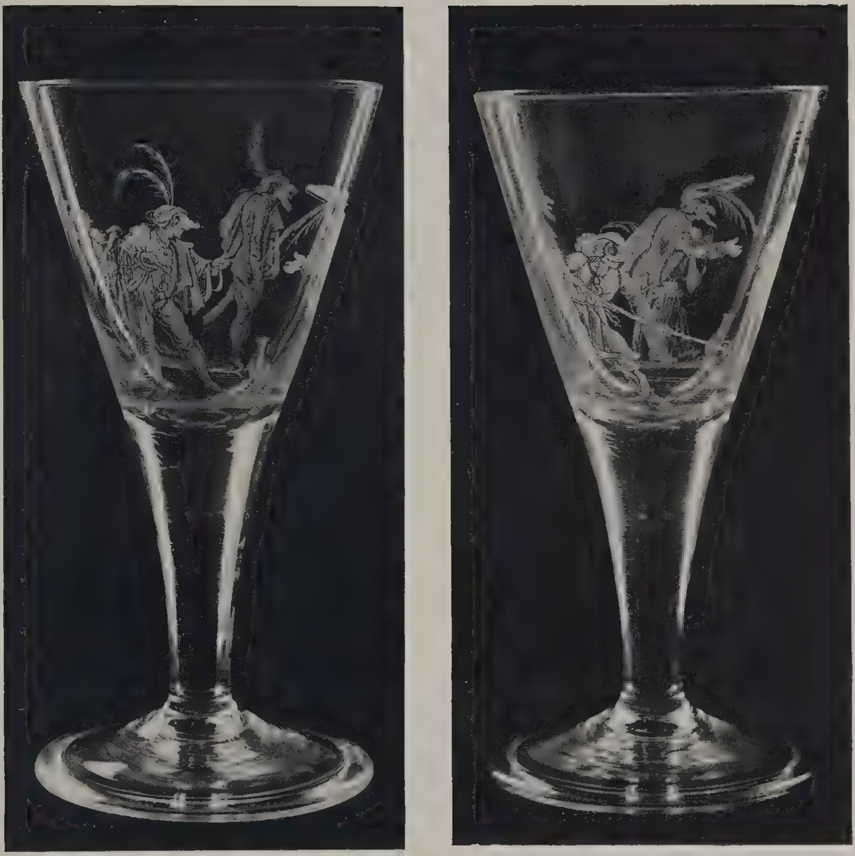

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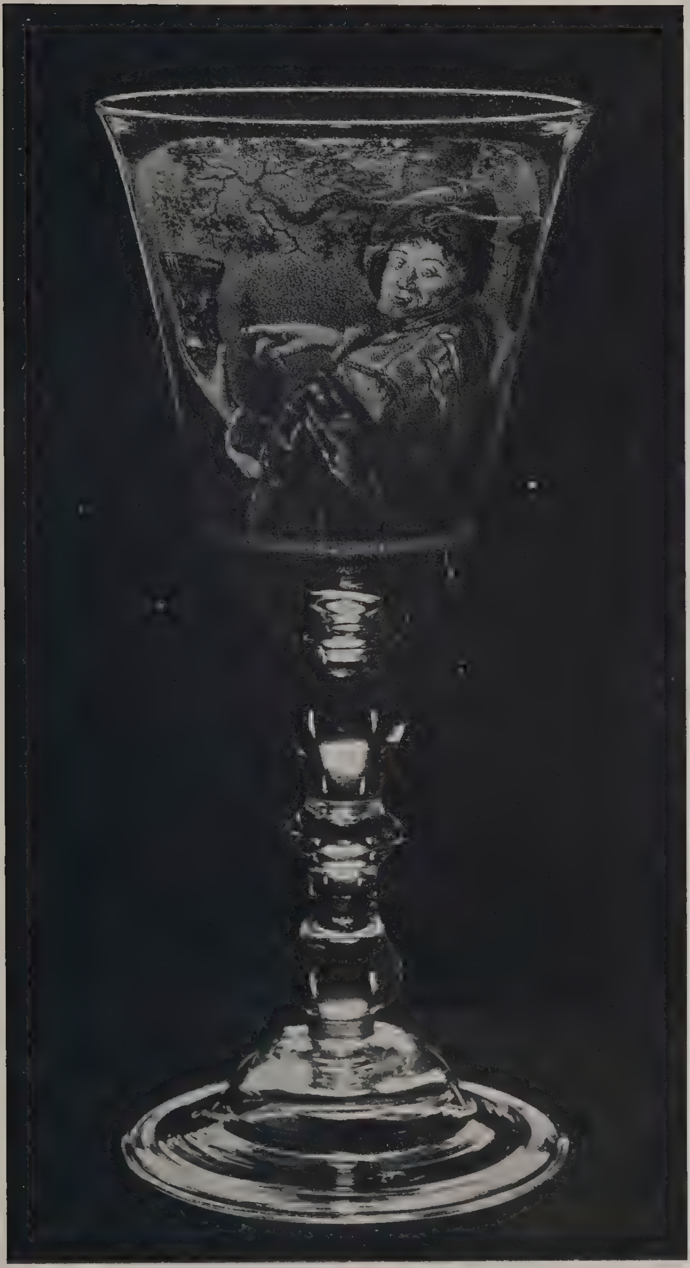

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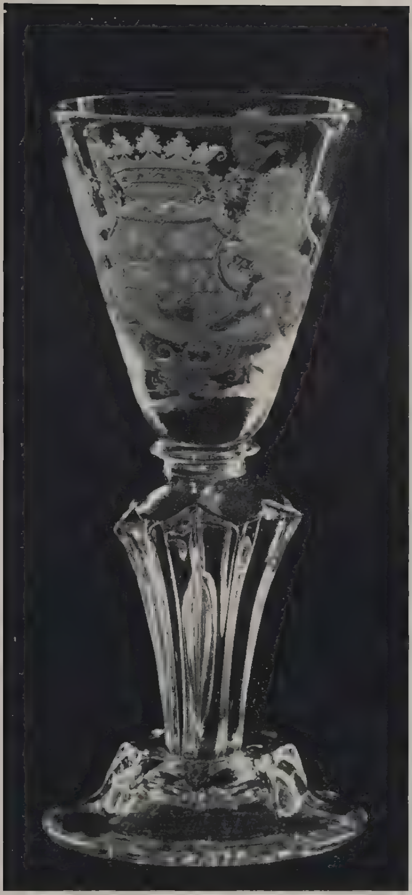

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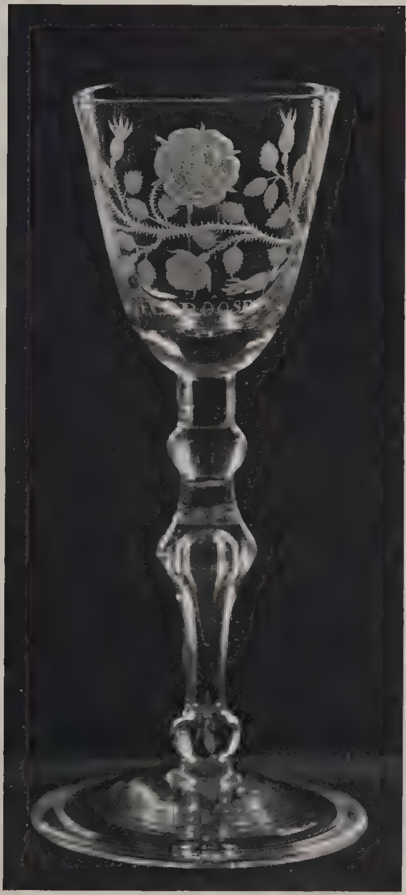

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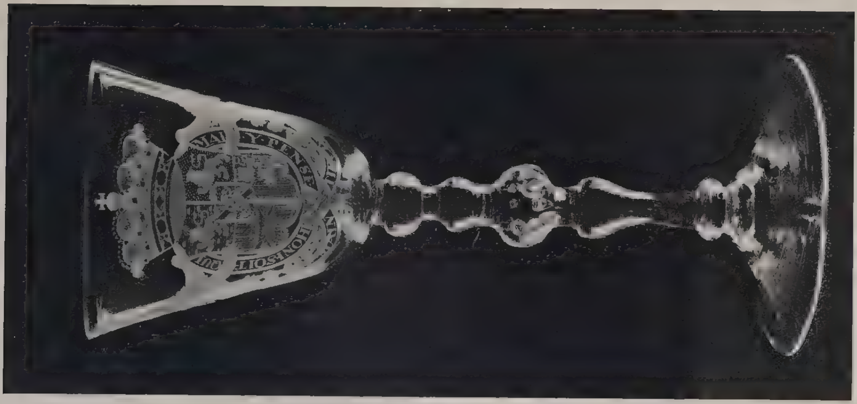
HONI SOIT QUI MAL Y PENSE

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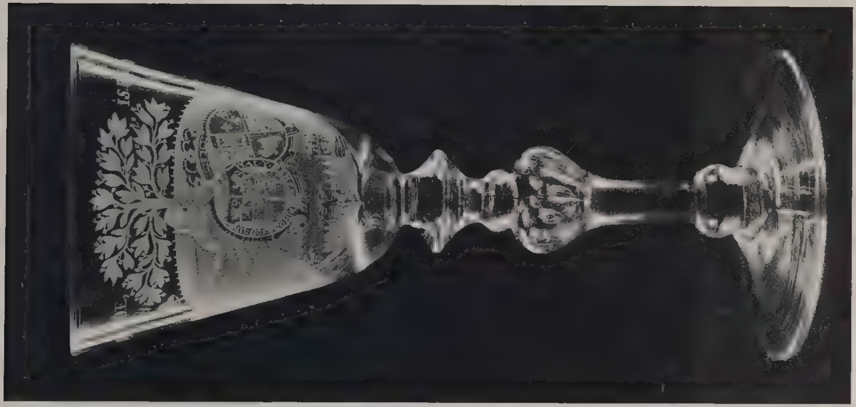

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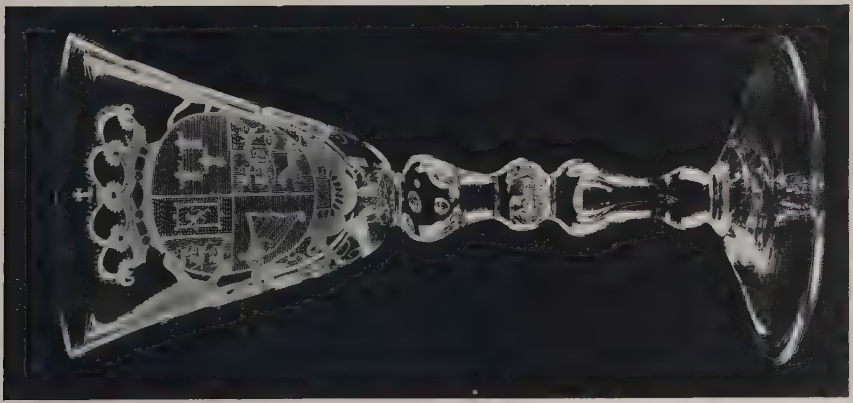

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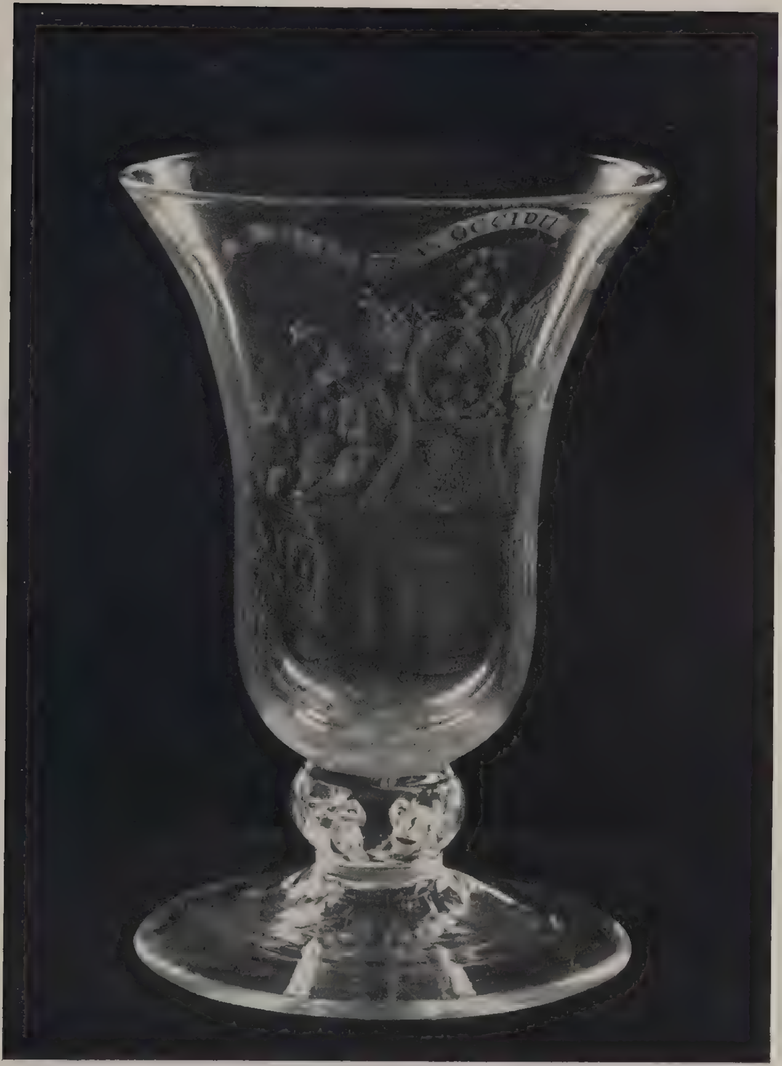

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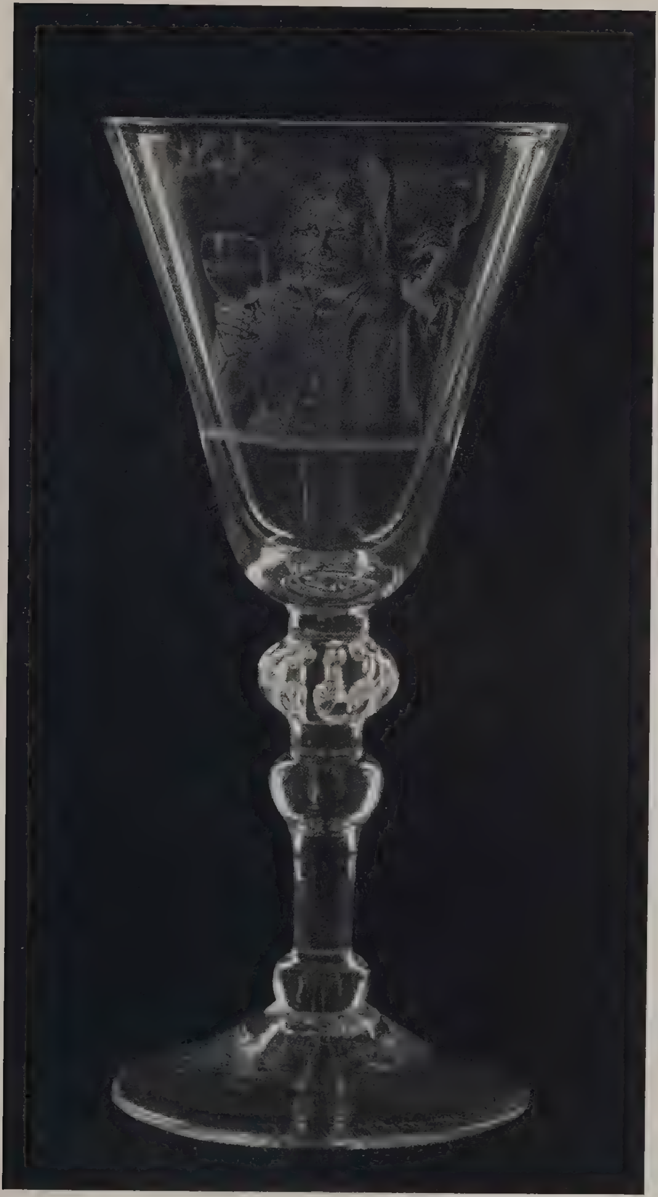

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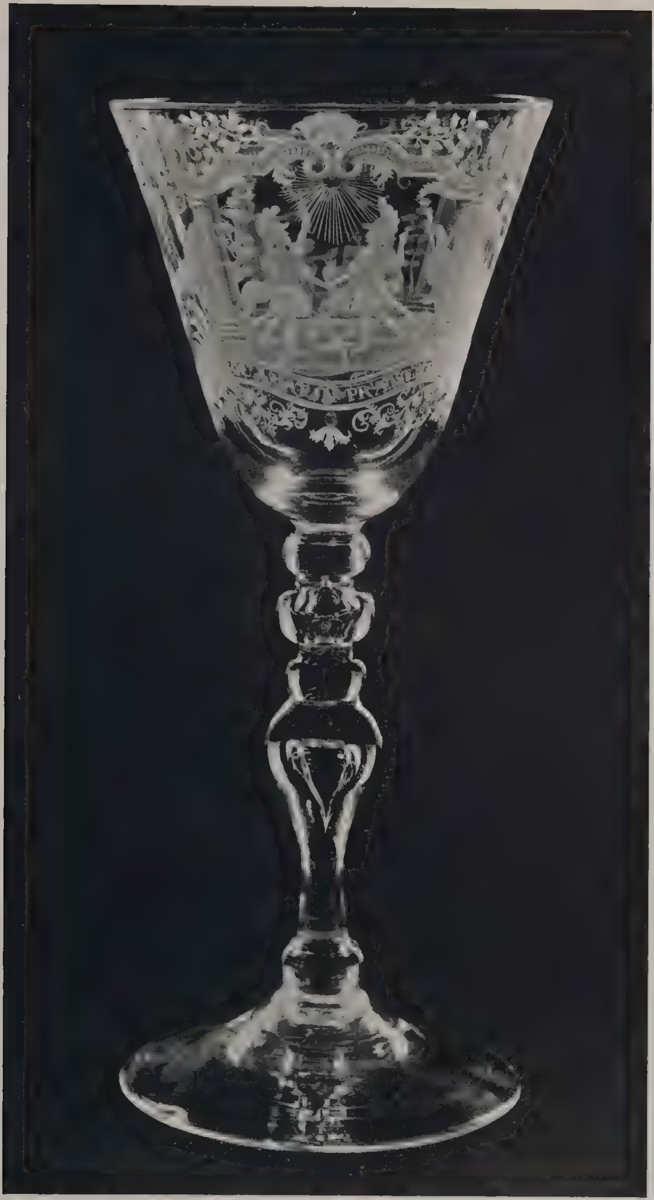

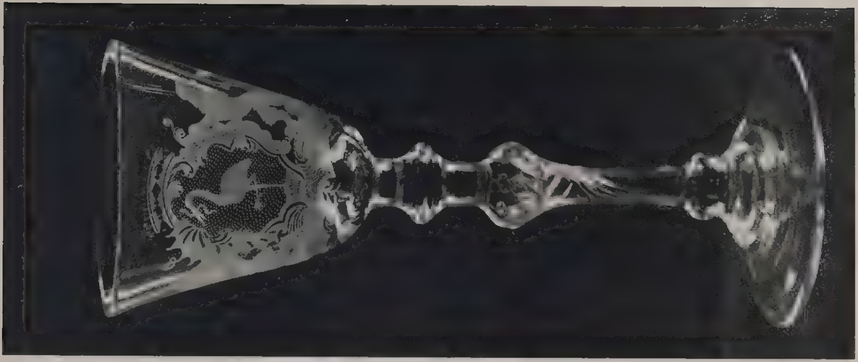

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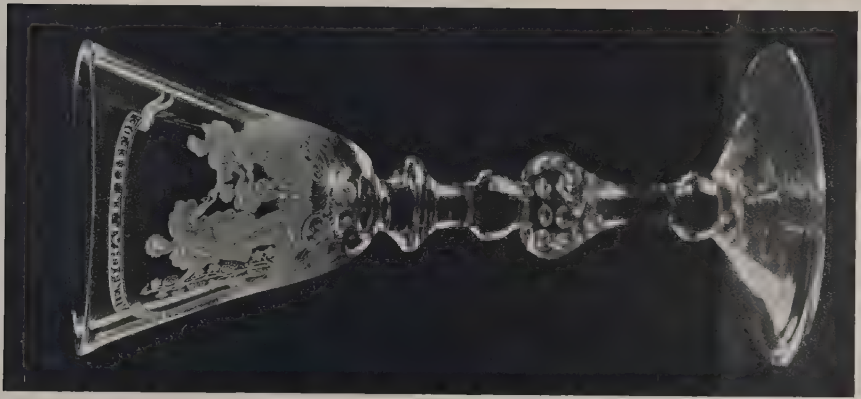

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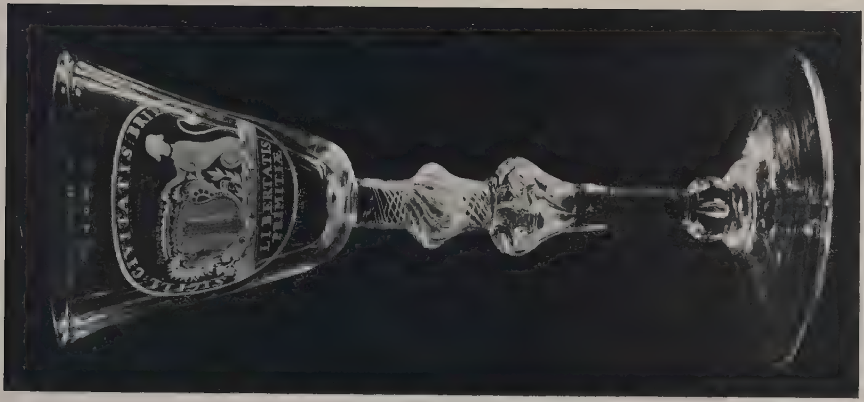

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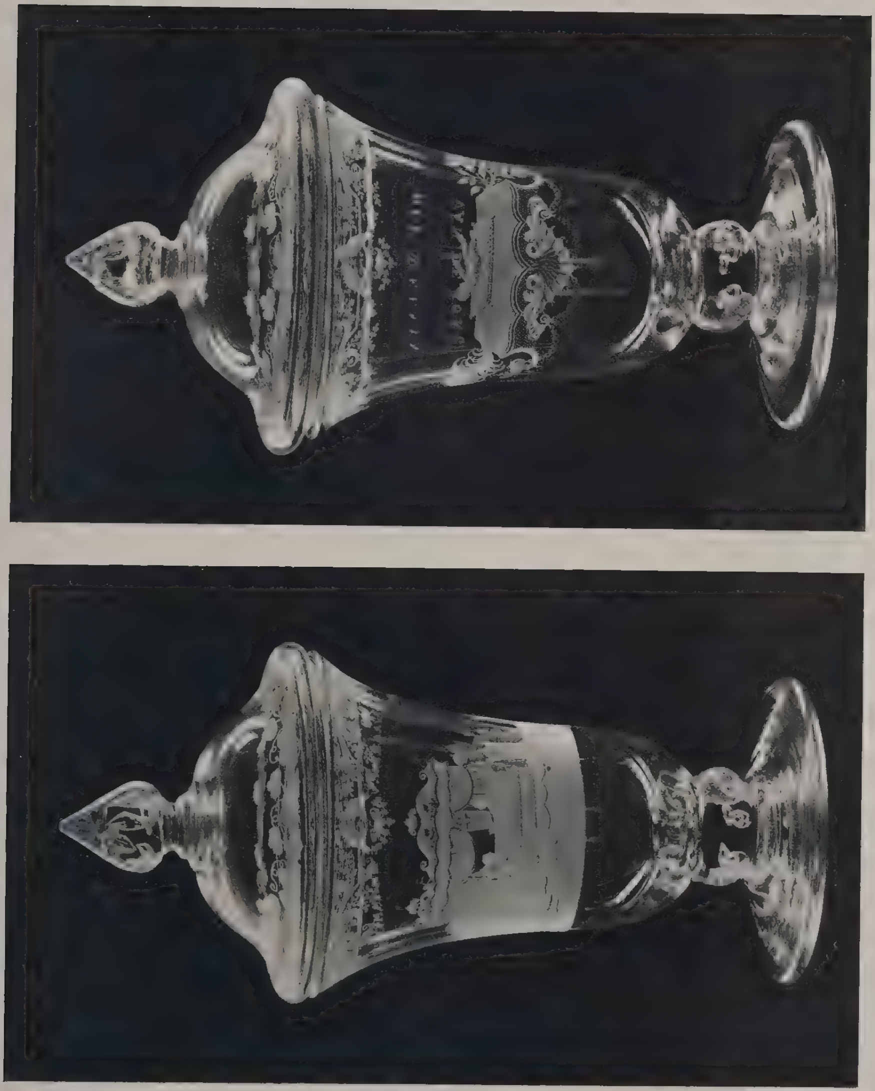

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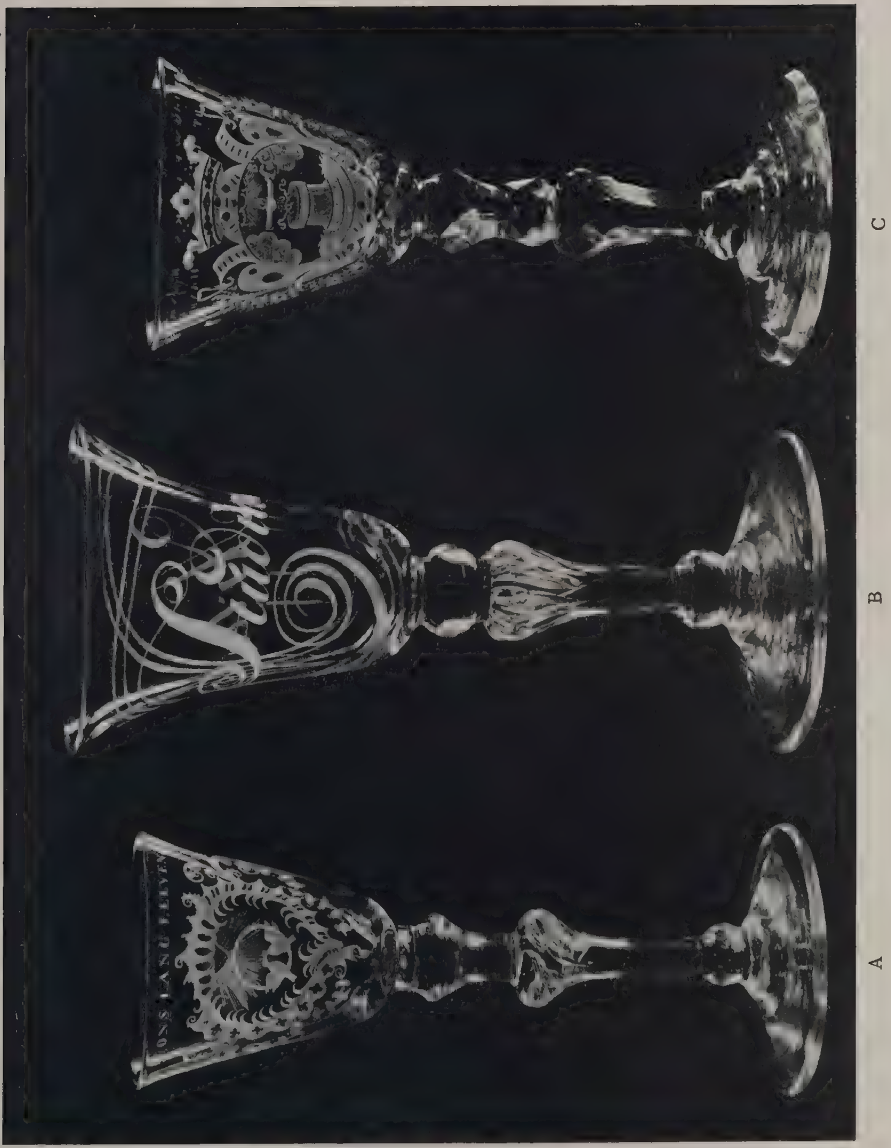

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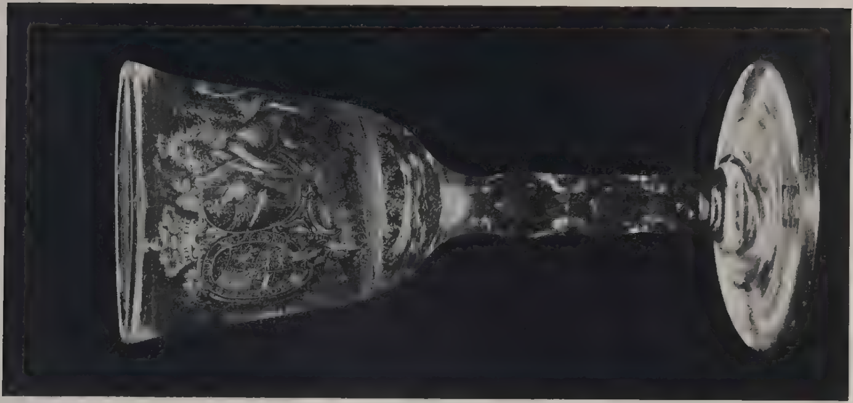
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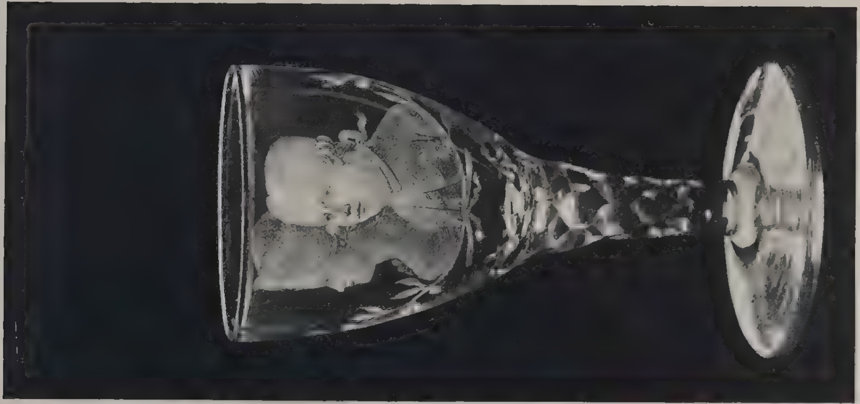
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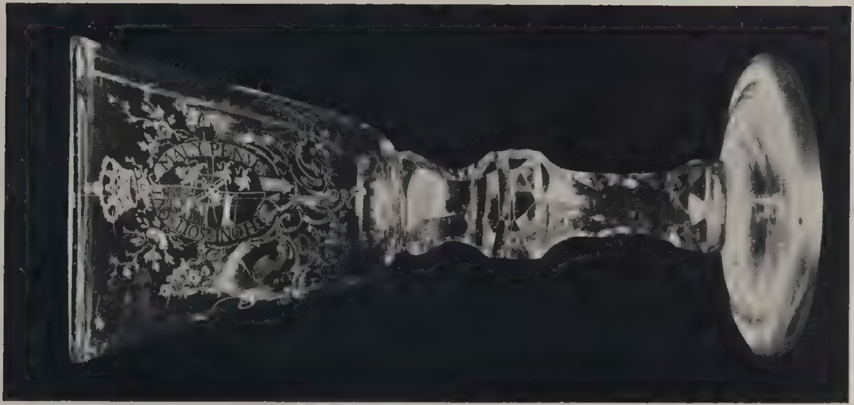
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78

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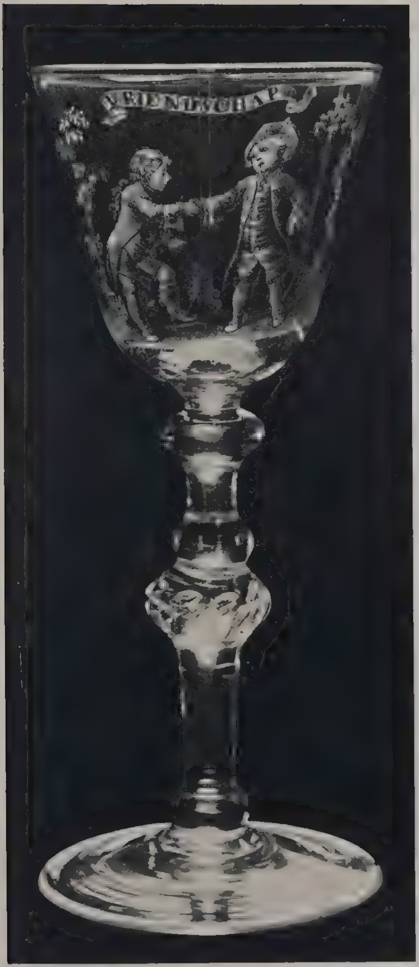
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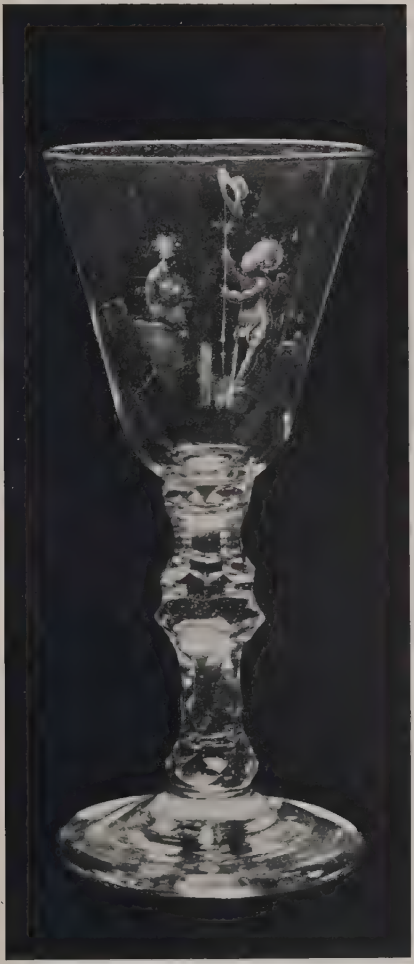

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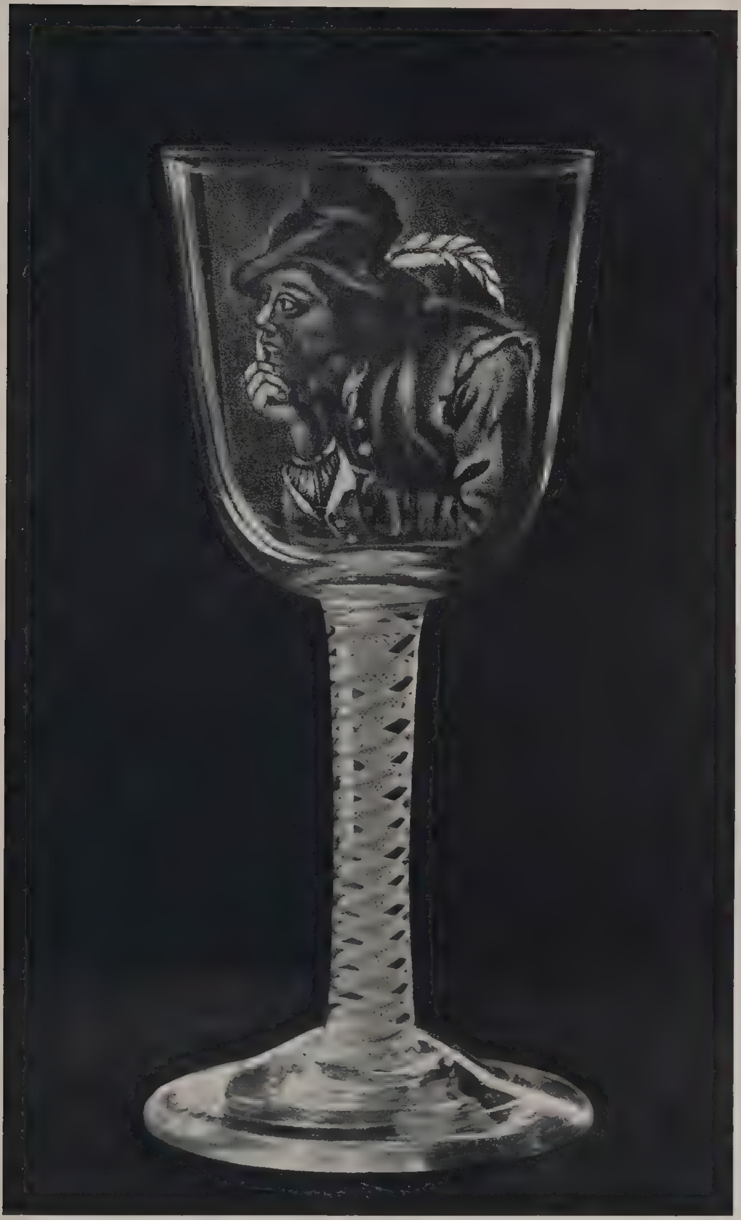

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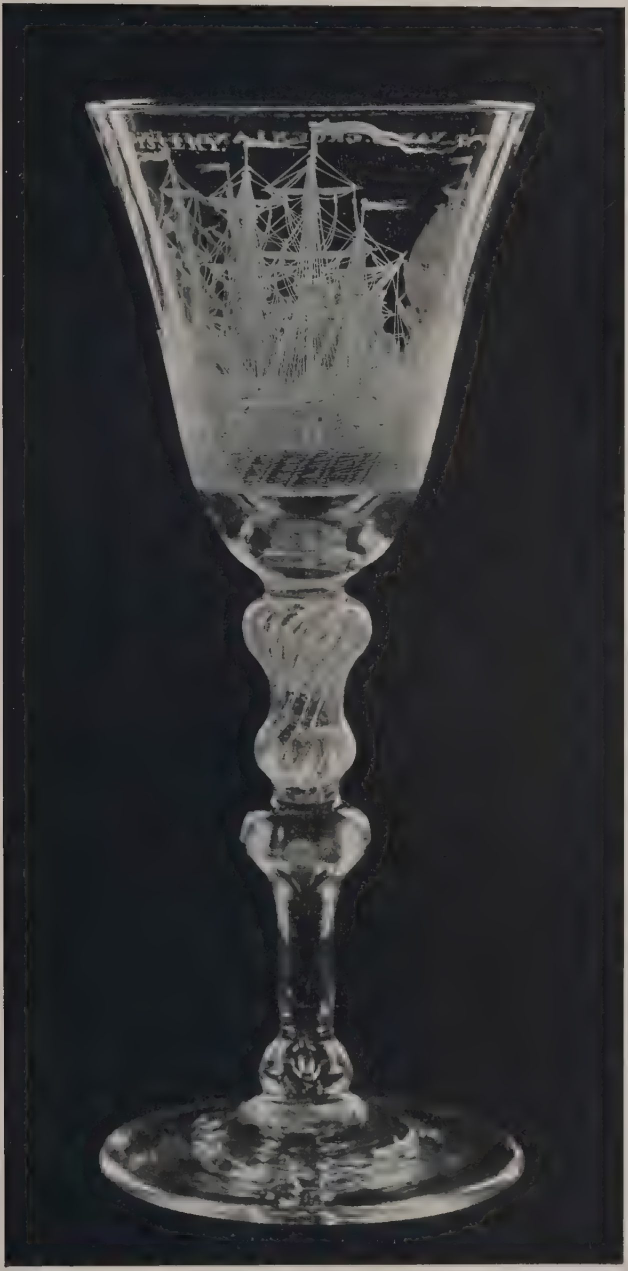

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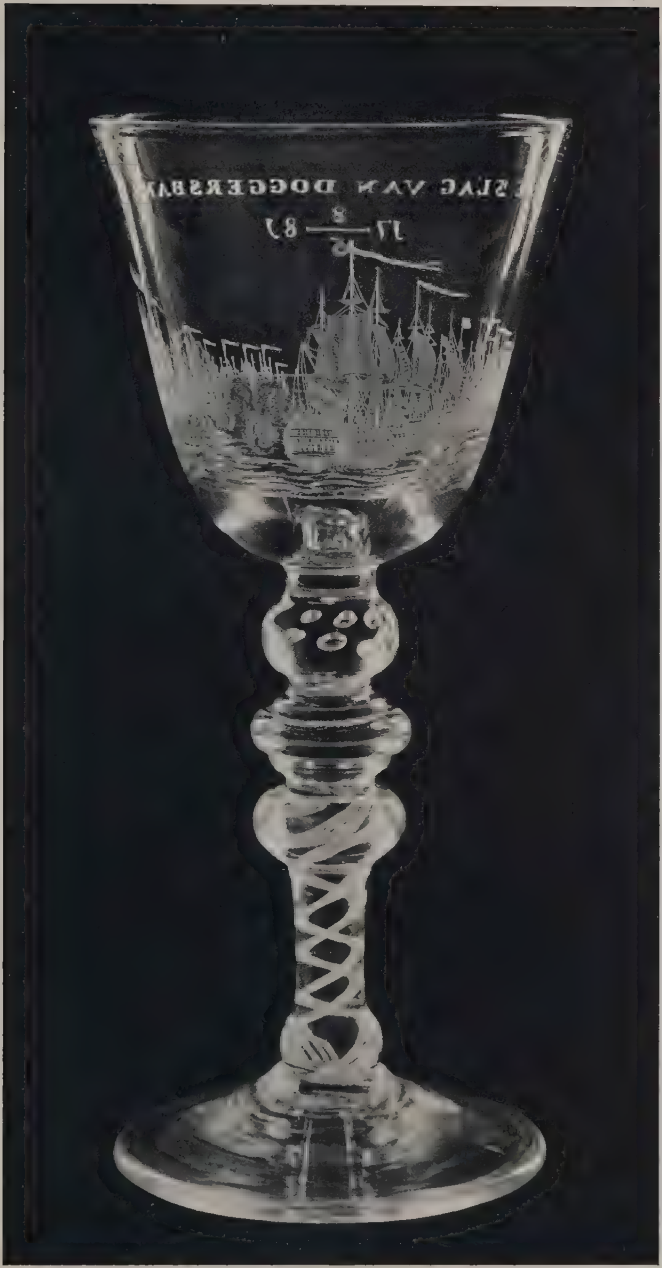
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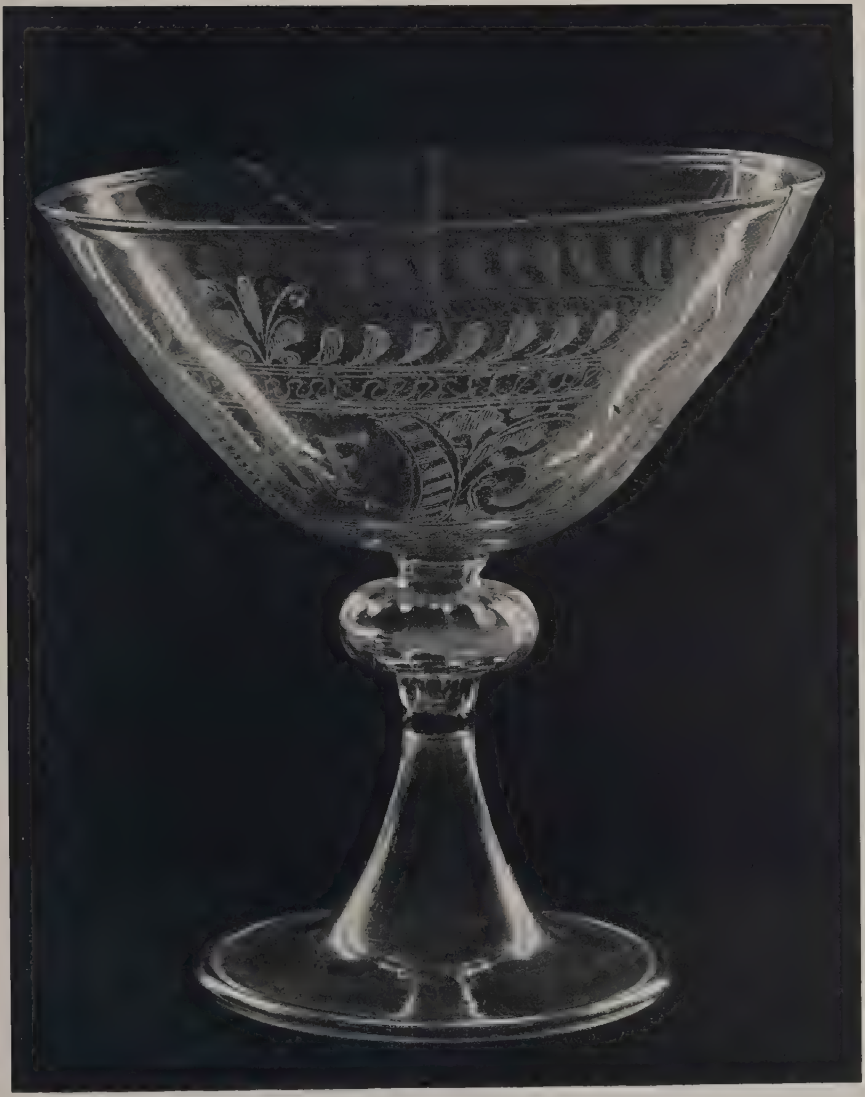
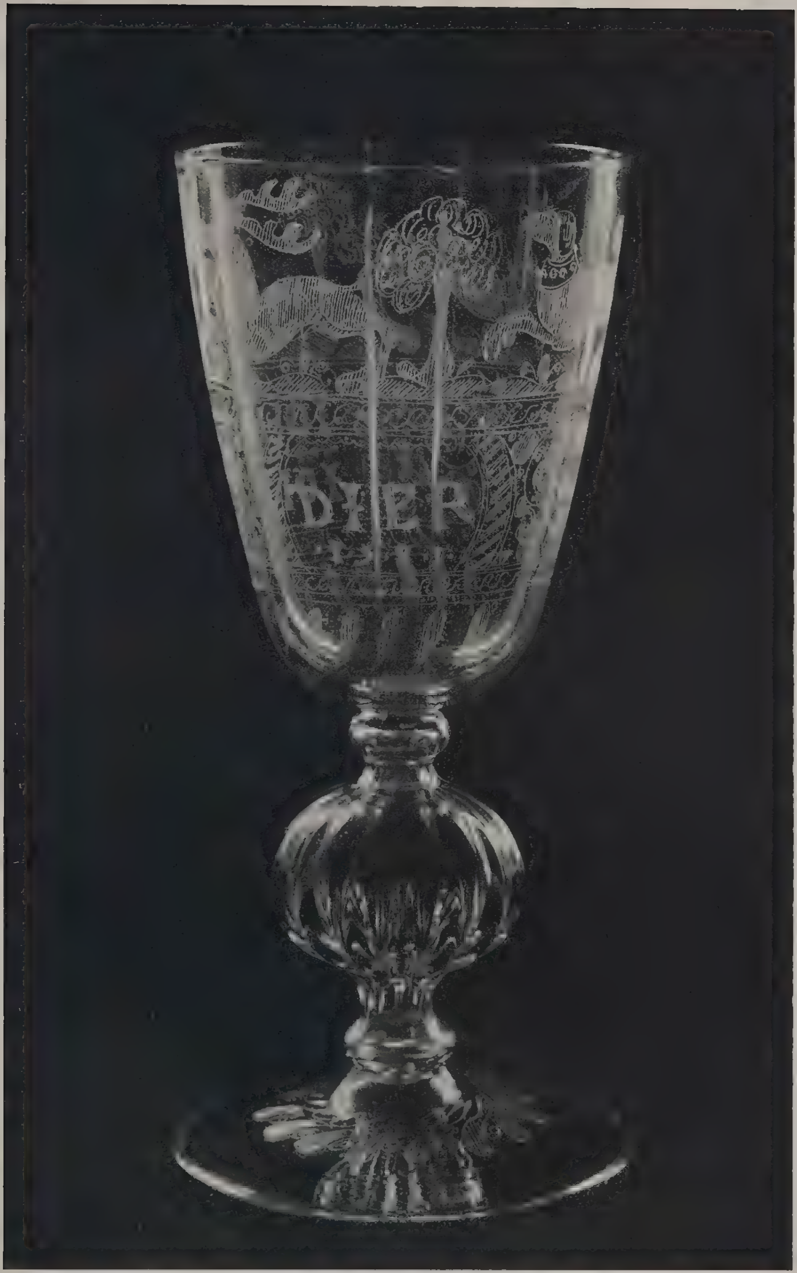
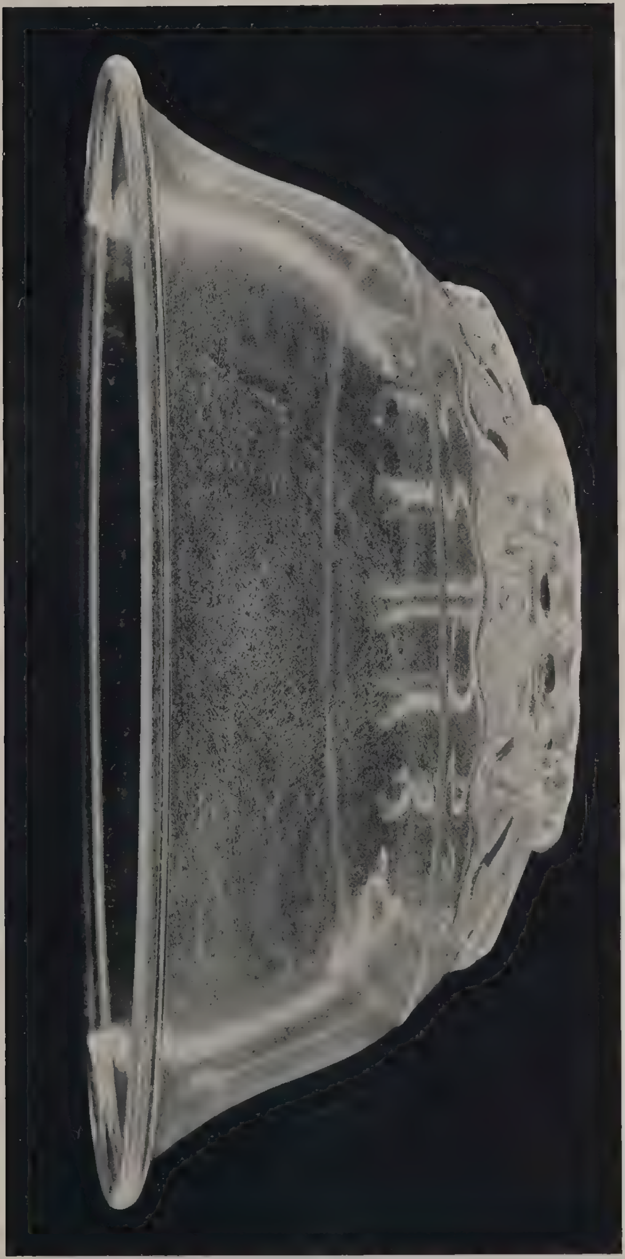


83

ENGLISH GLASS





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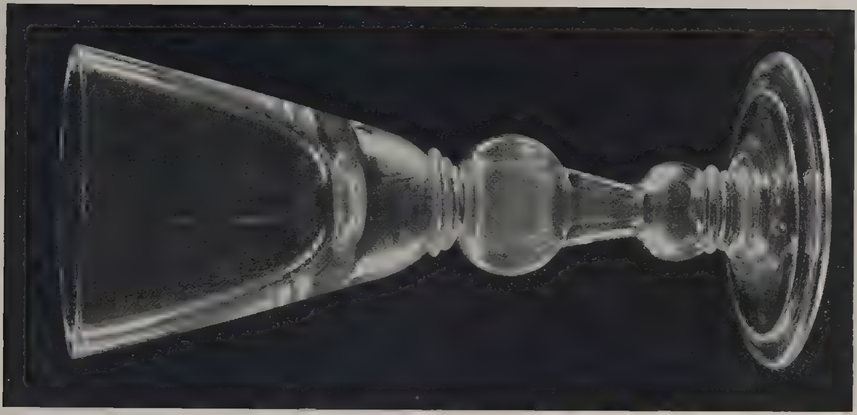

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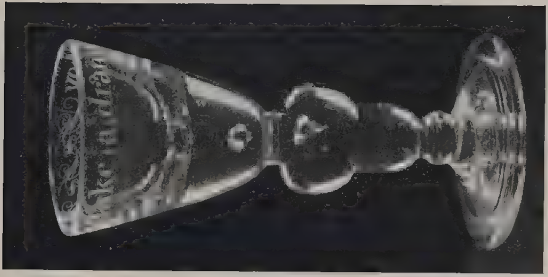

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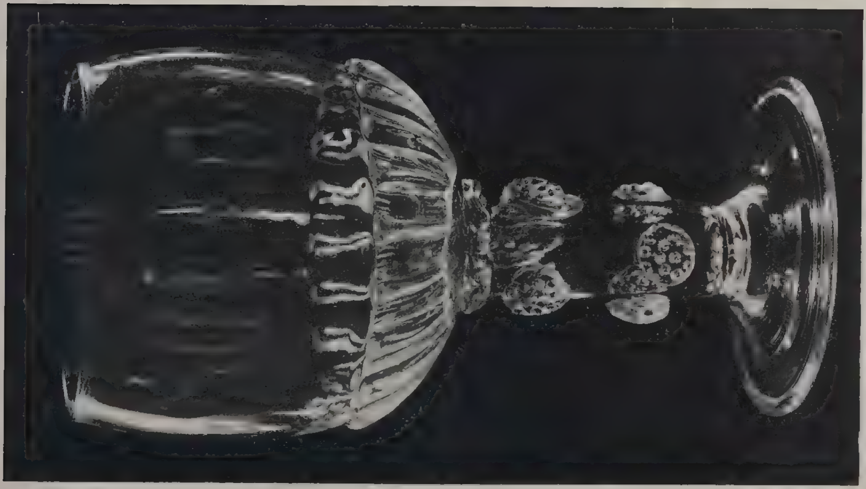

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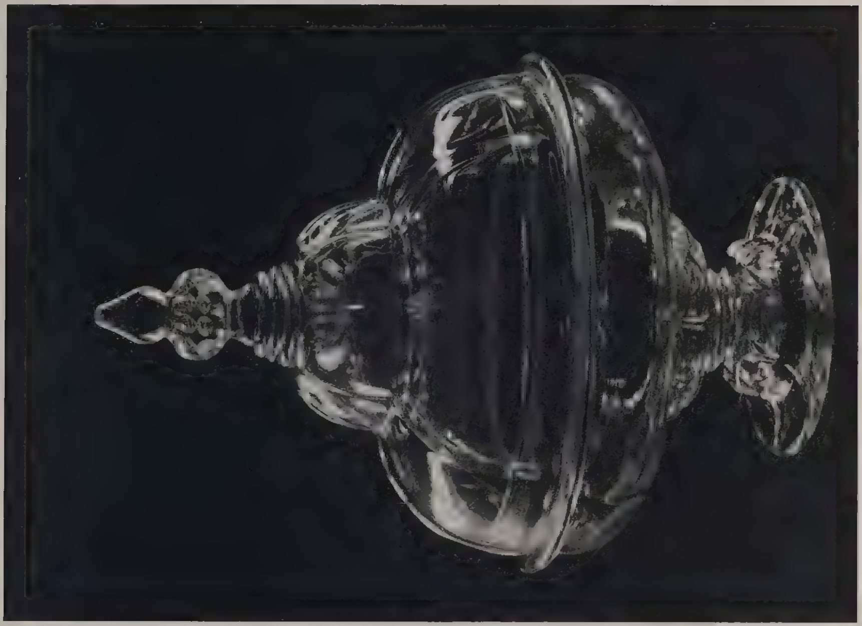

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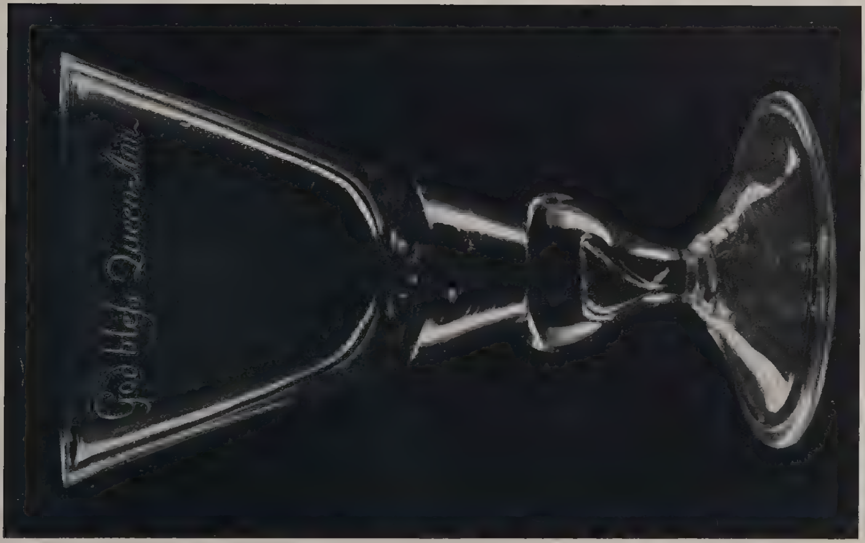
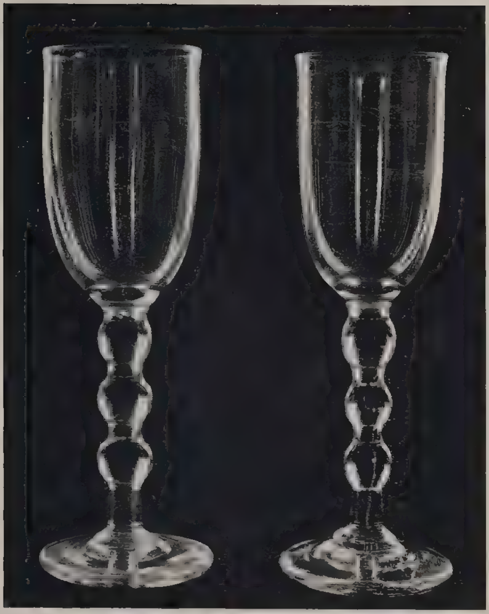

God bless Queen Ann

A

ENGLISH GLASS



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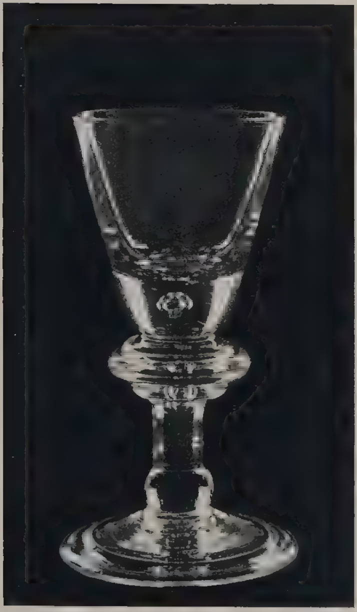

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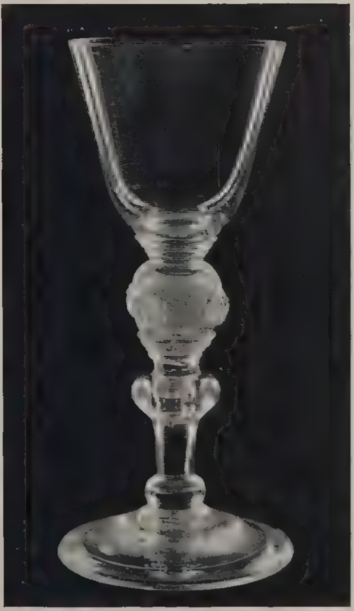

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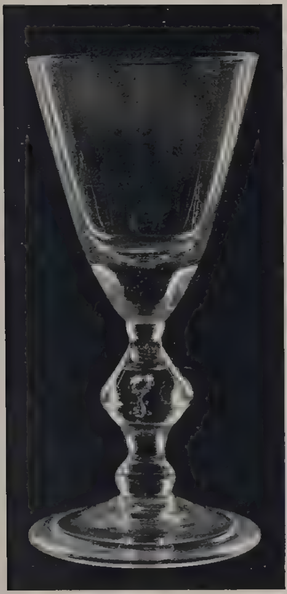

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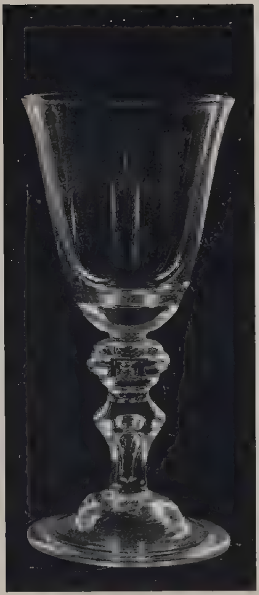

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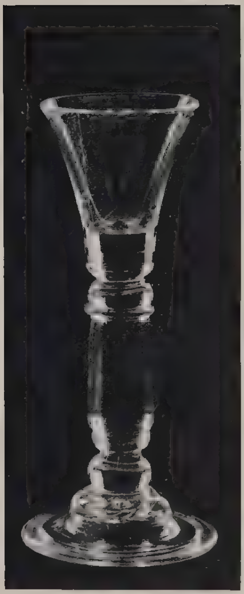

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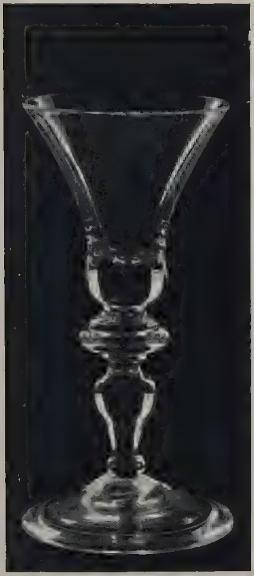

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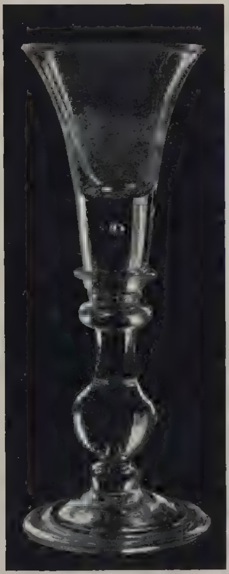

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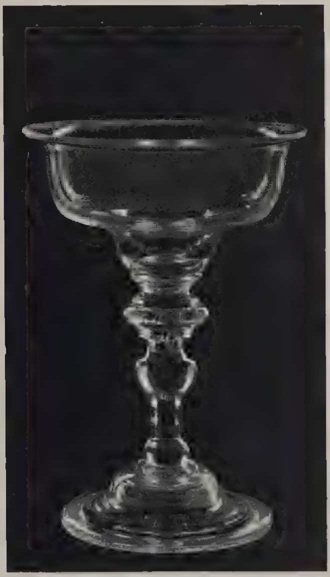
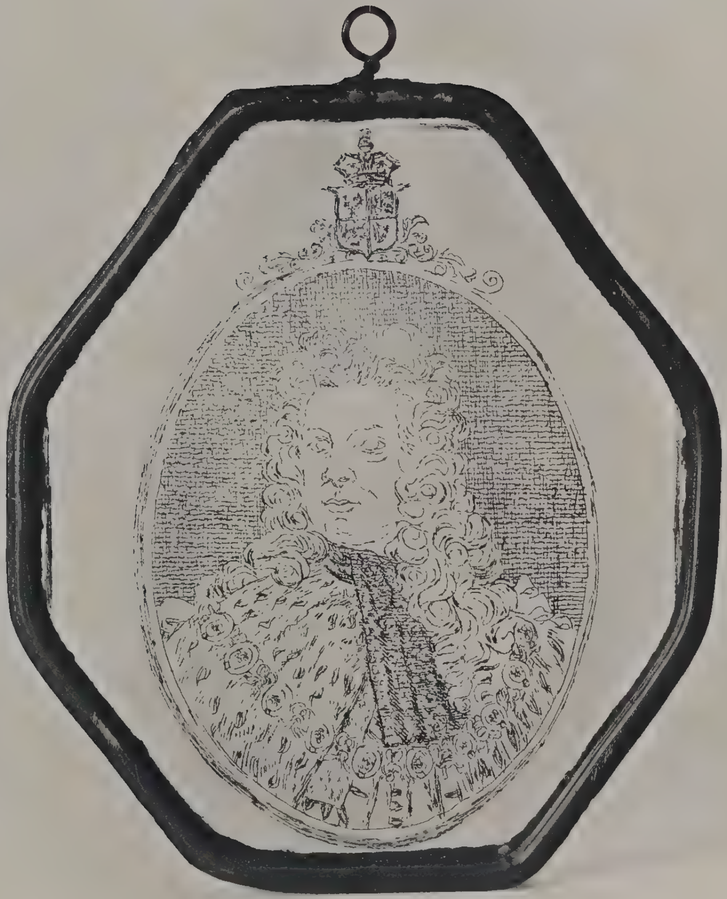


F

89

ENGLISH GLASS



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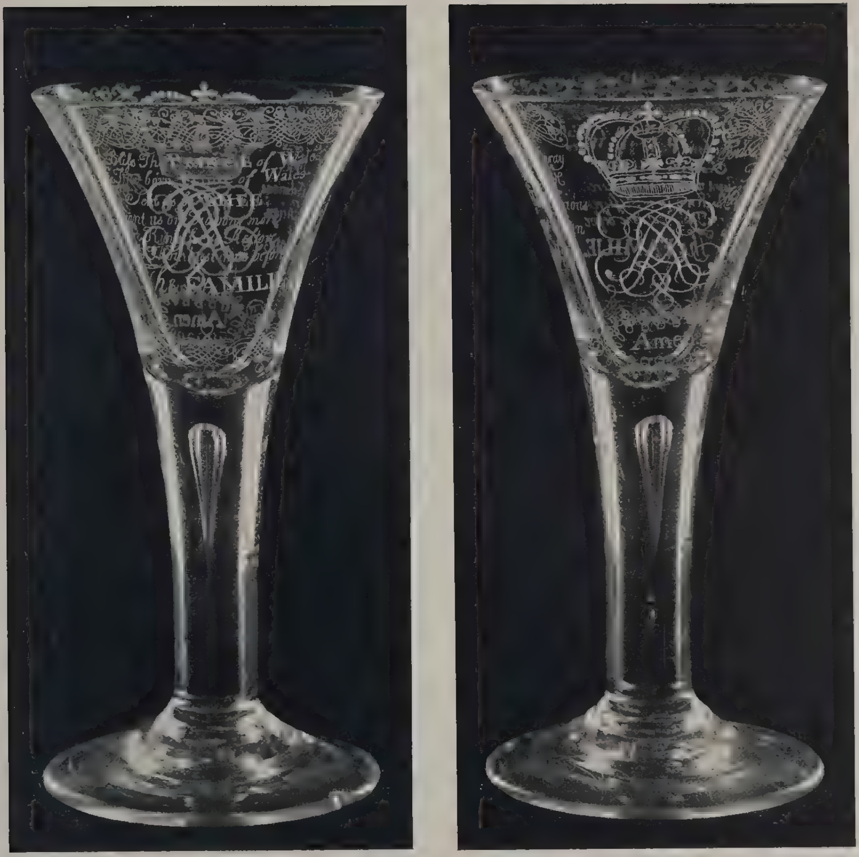

91

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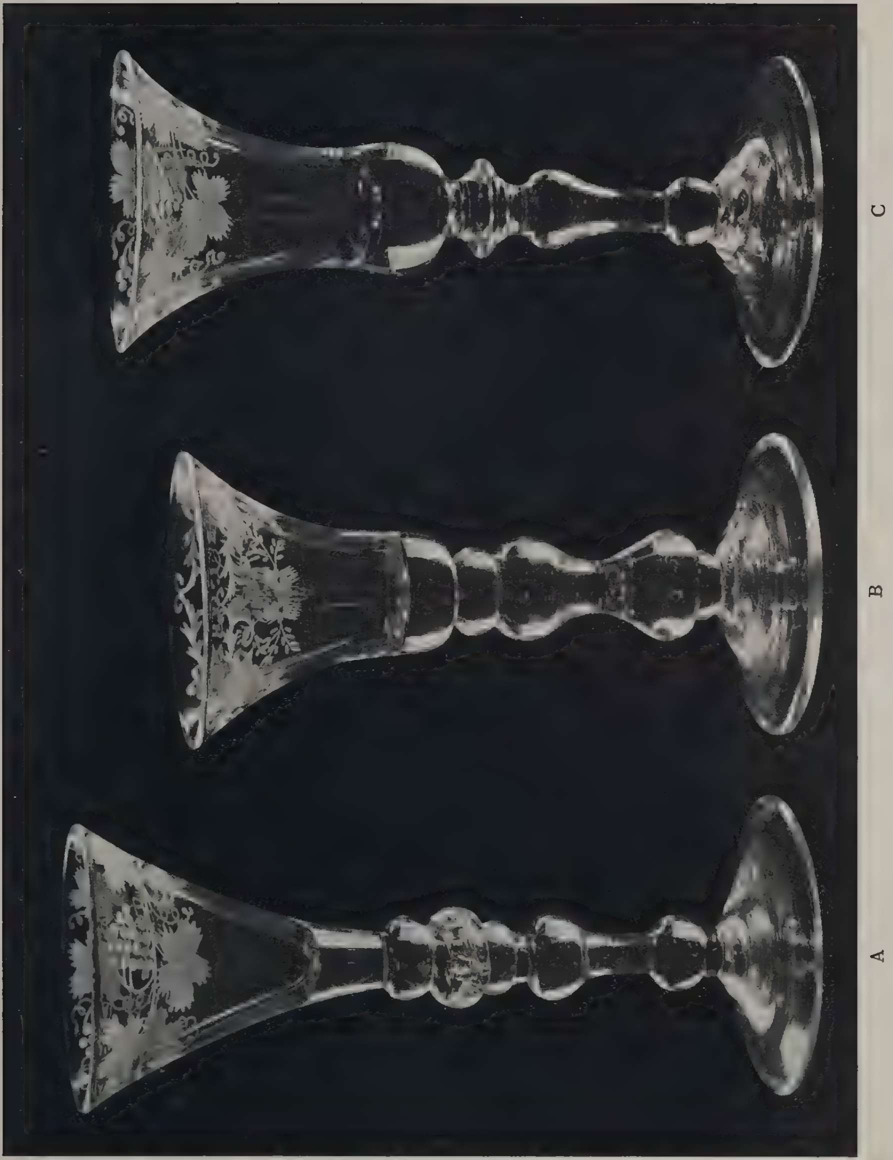

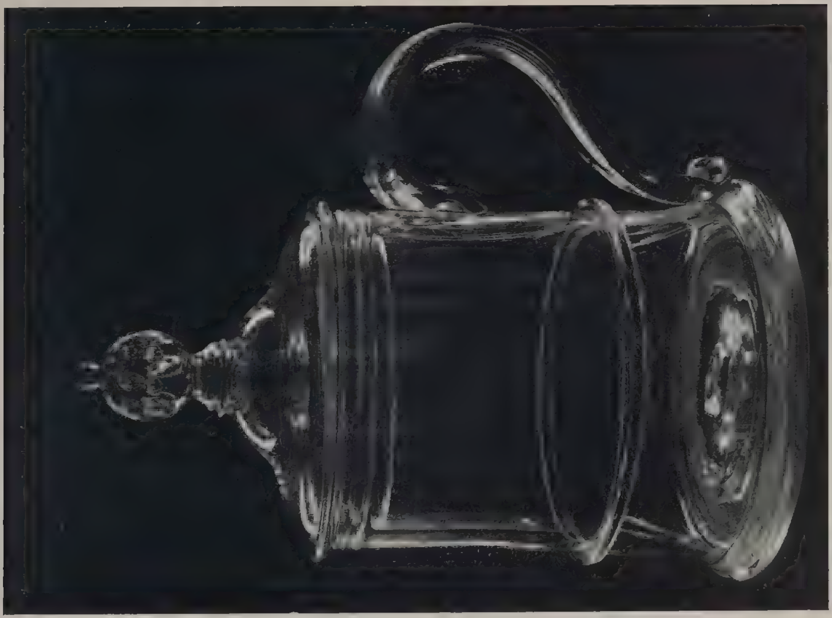

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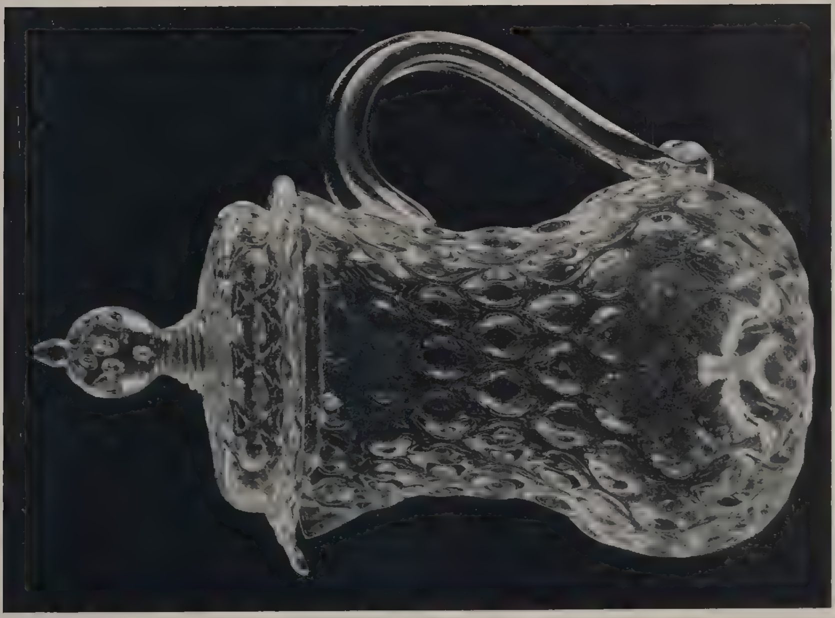

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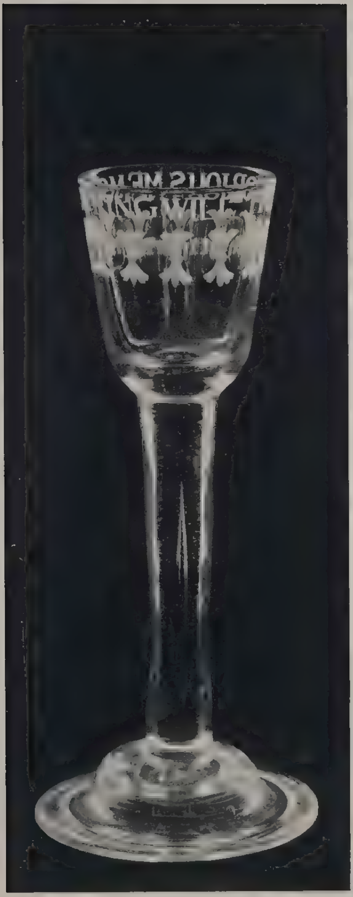

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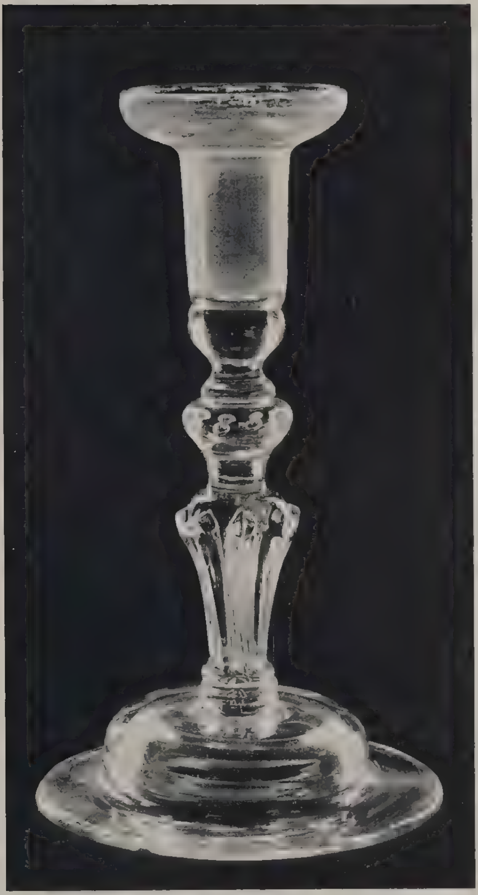

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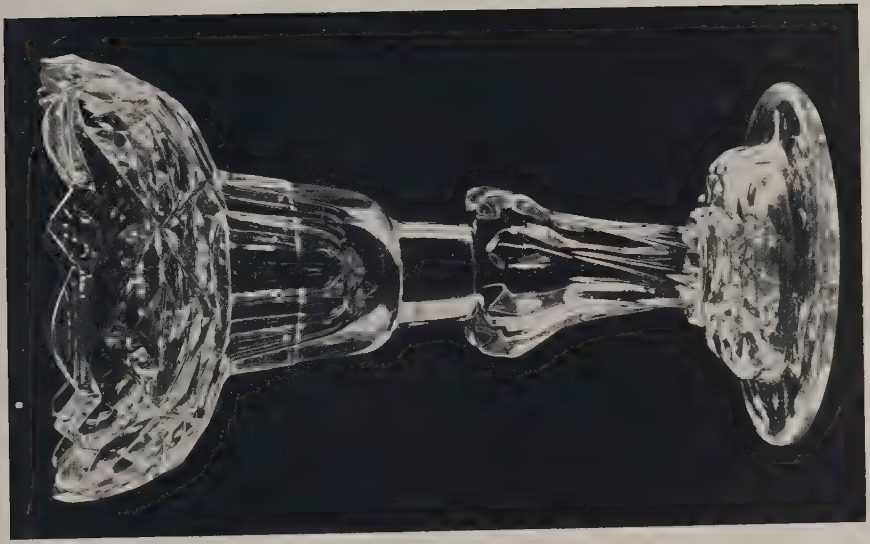
94



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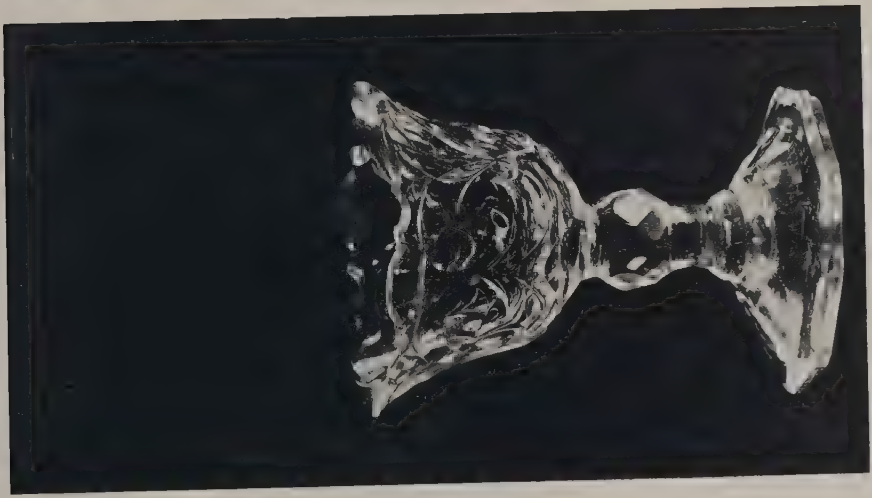

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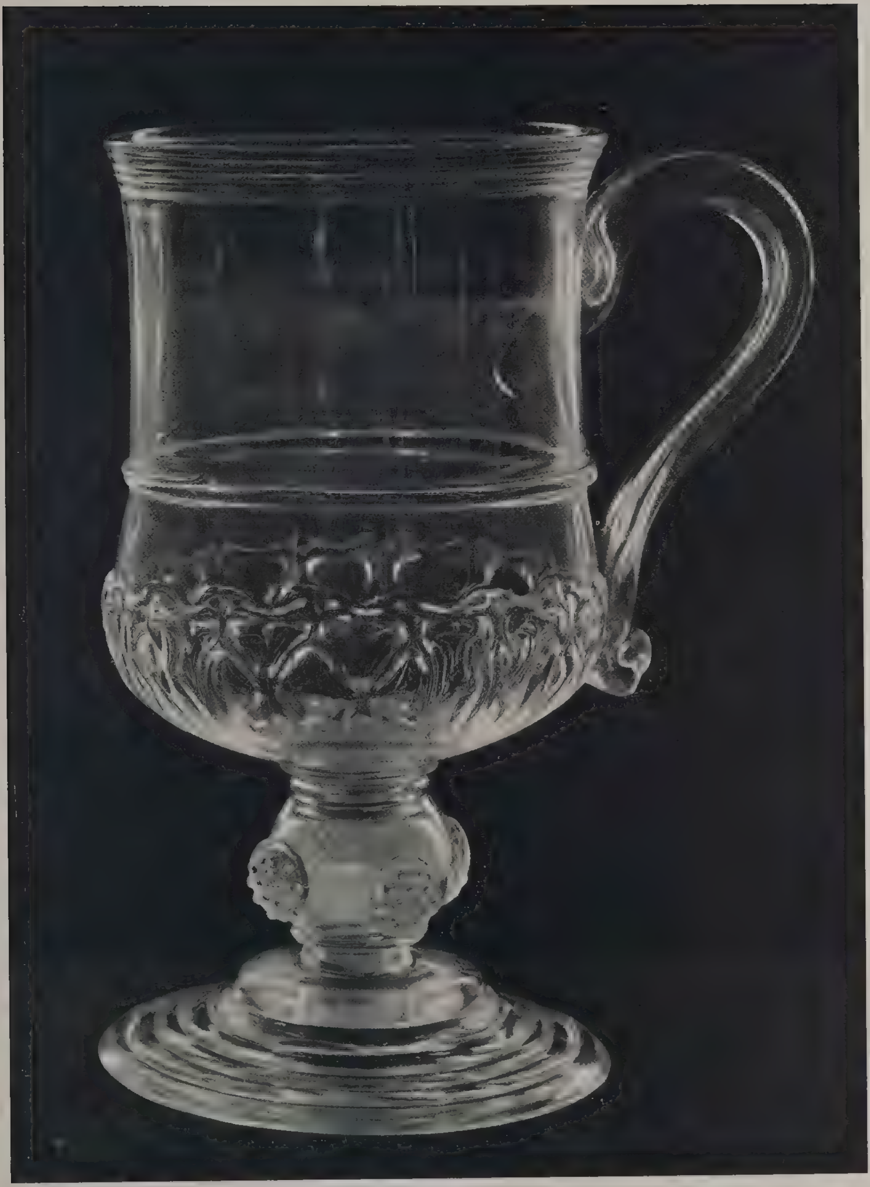
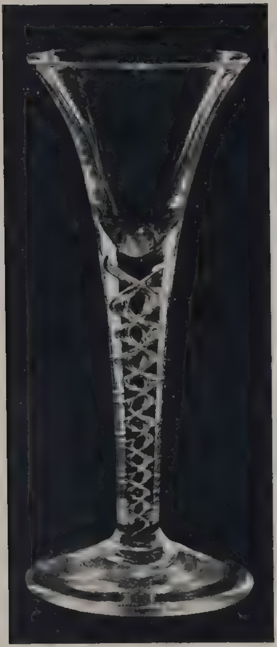
95

ENGLISH GLASS





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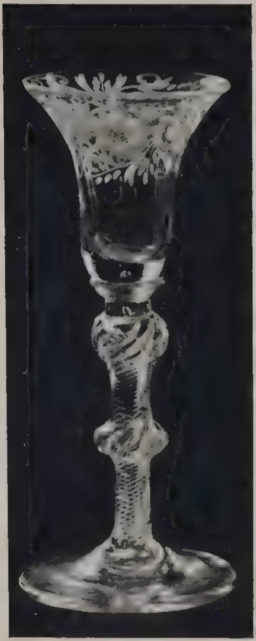

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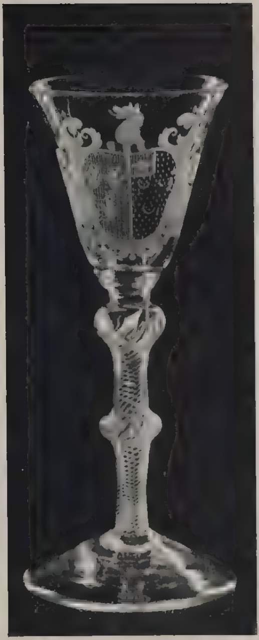

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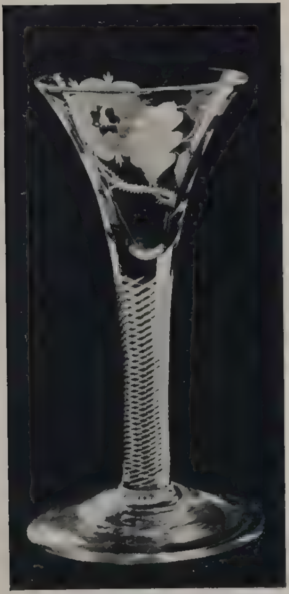

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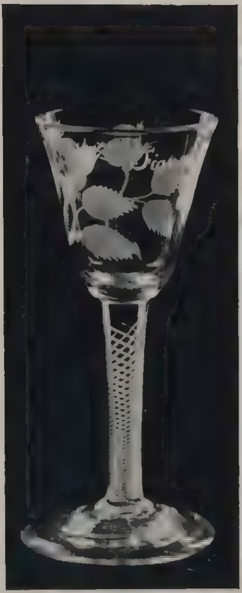

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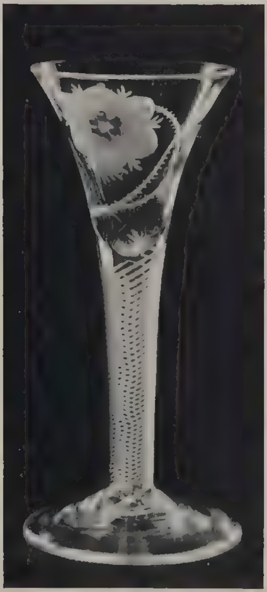

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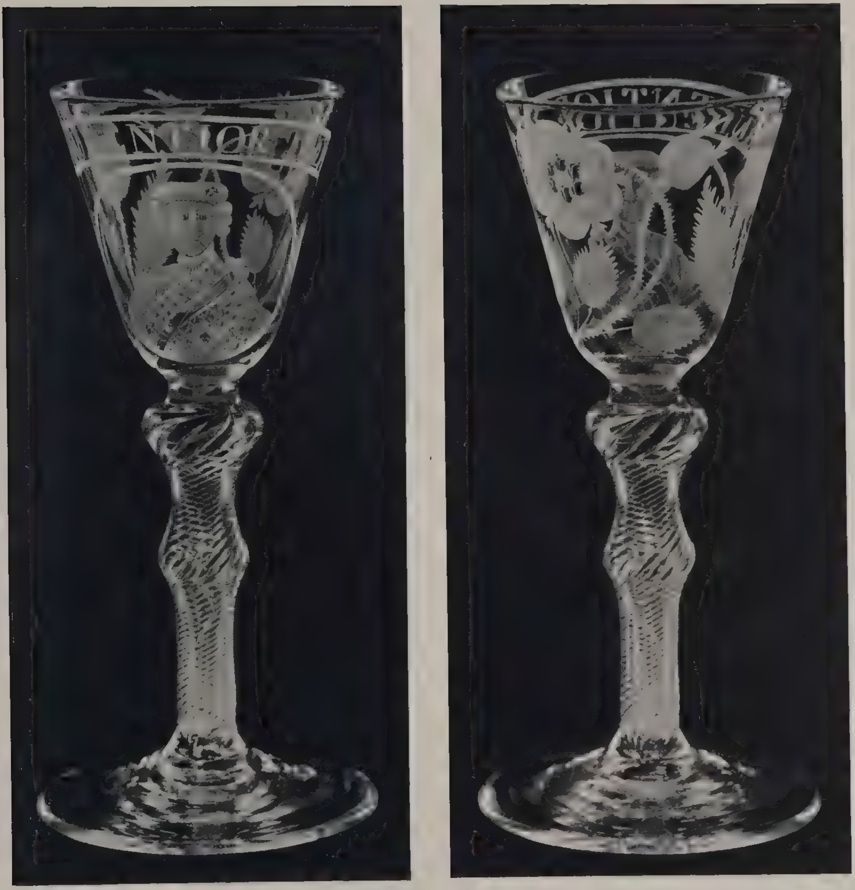
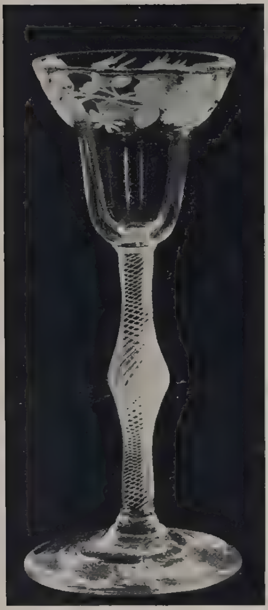
97

ENGLISH GLASS





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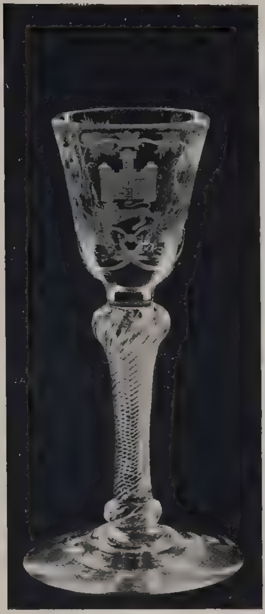

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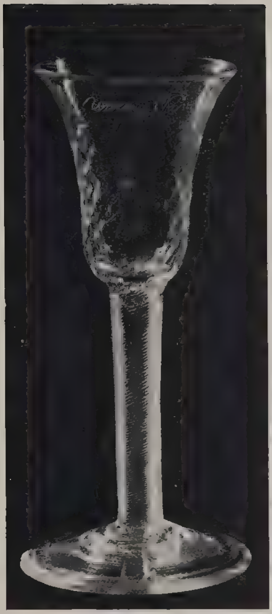

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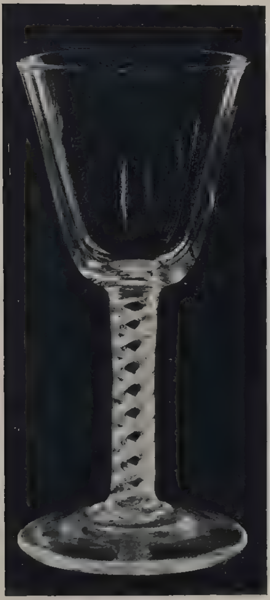

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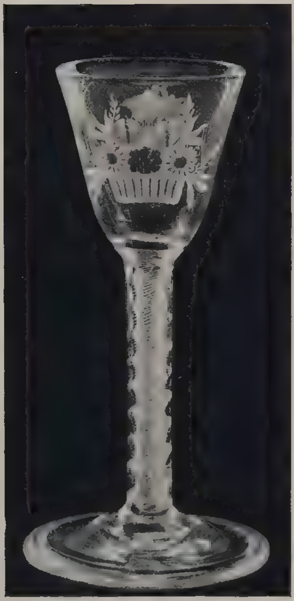

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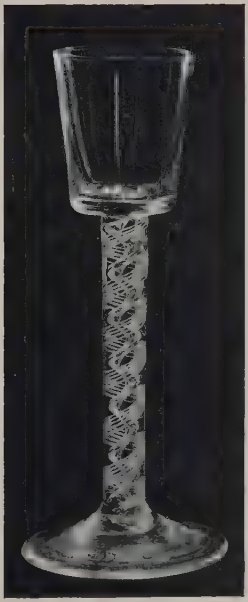

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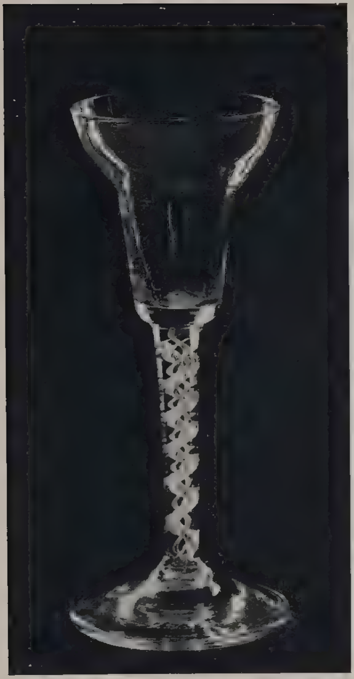
99

ENGLISH GLASS



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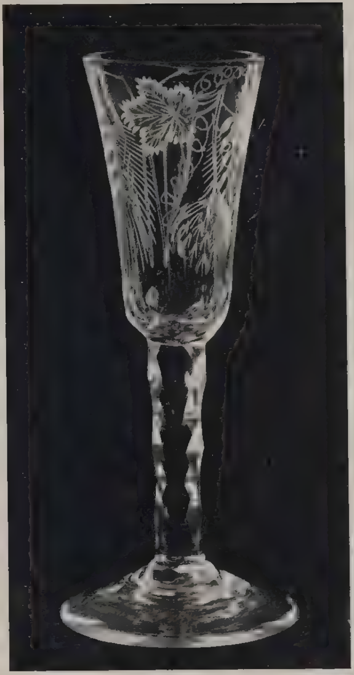

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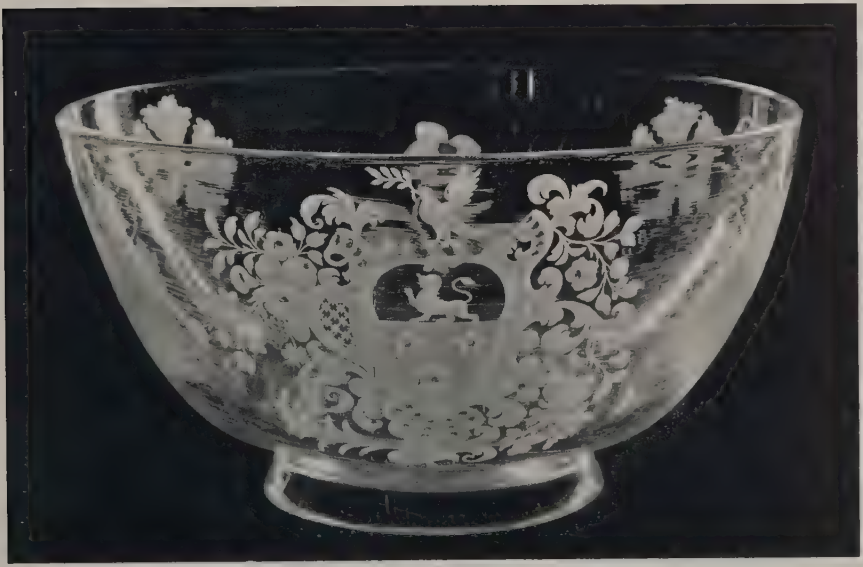

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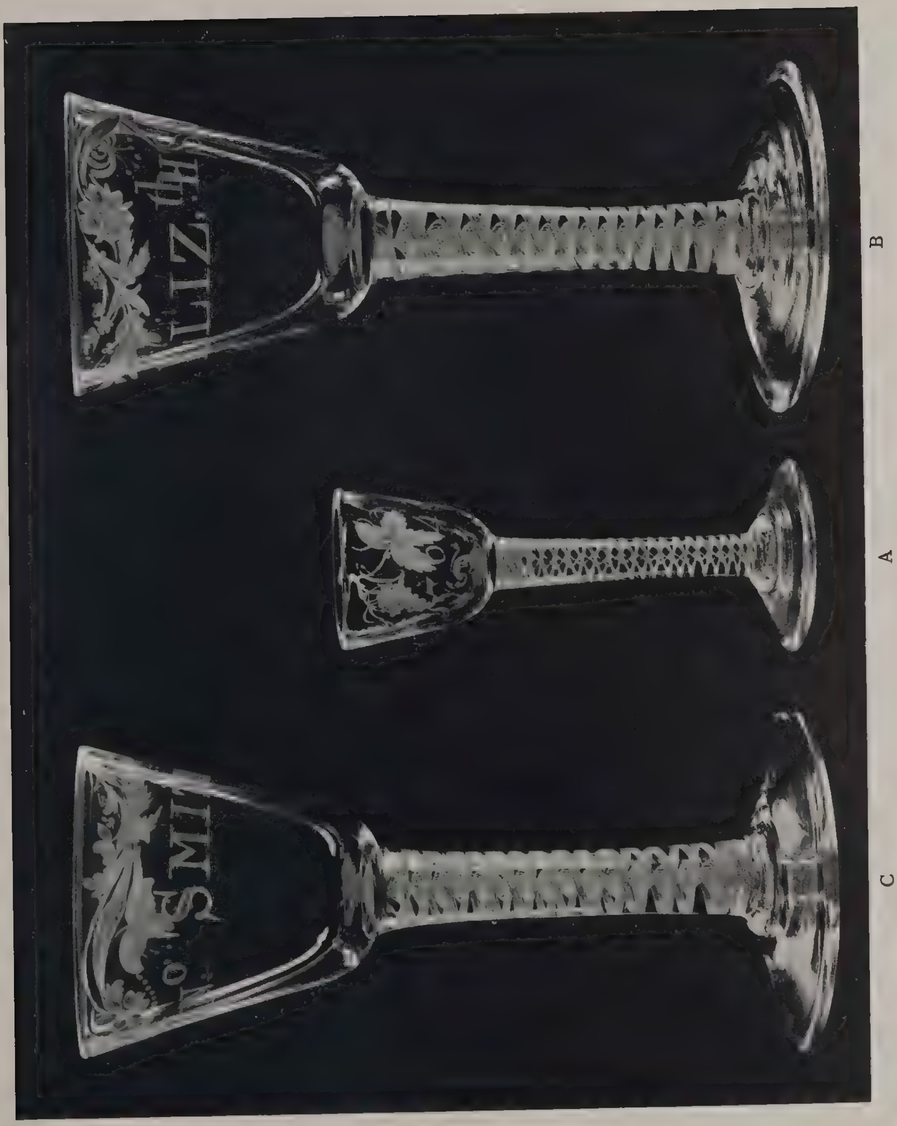
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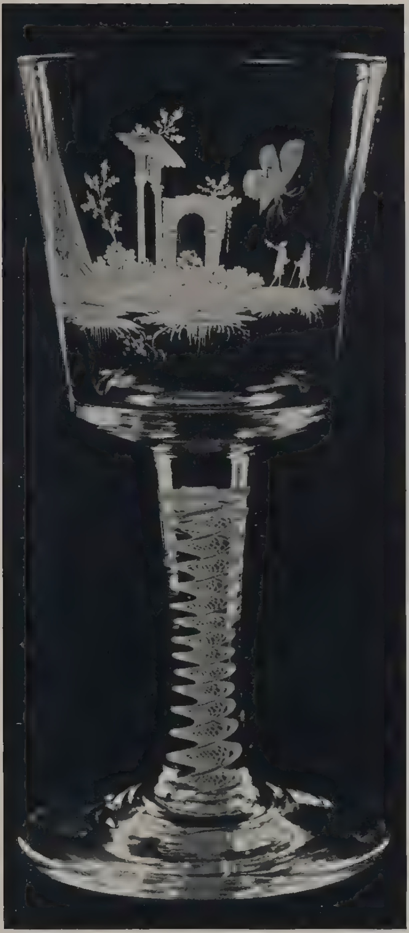
101

ENGLISH GLASS



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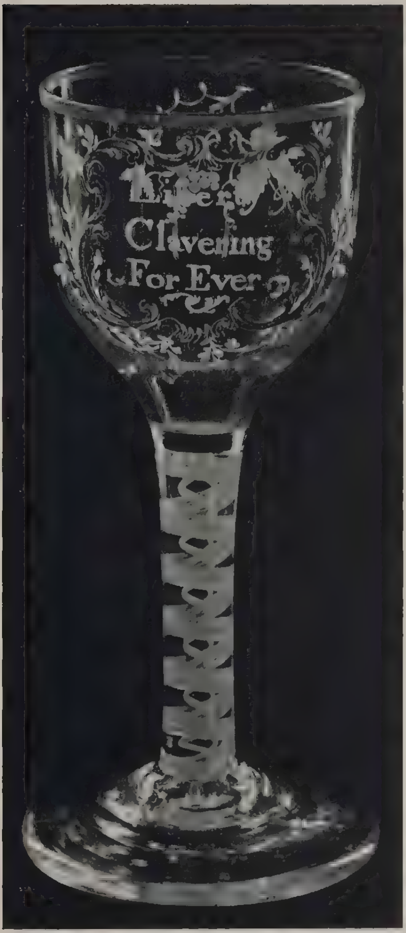
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For Ever

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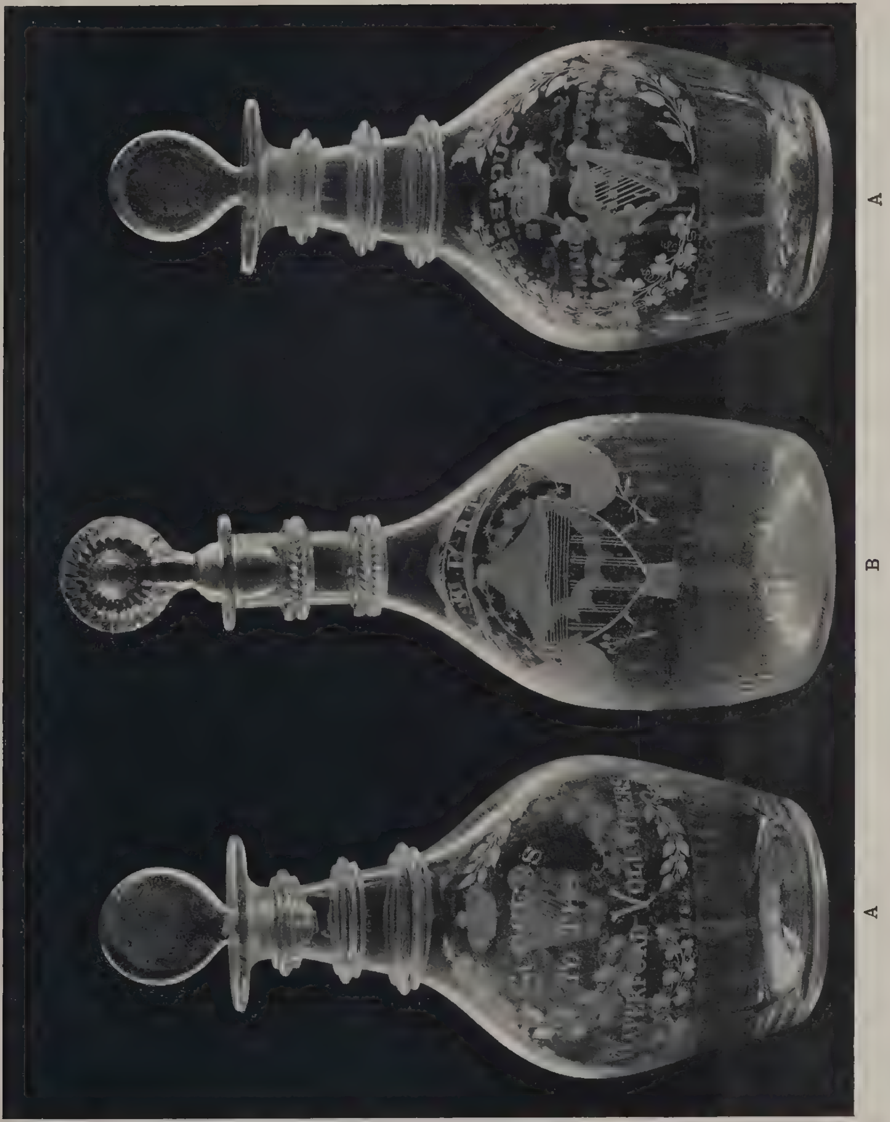
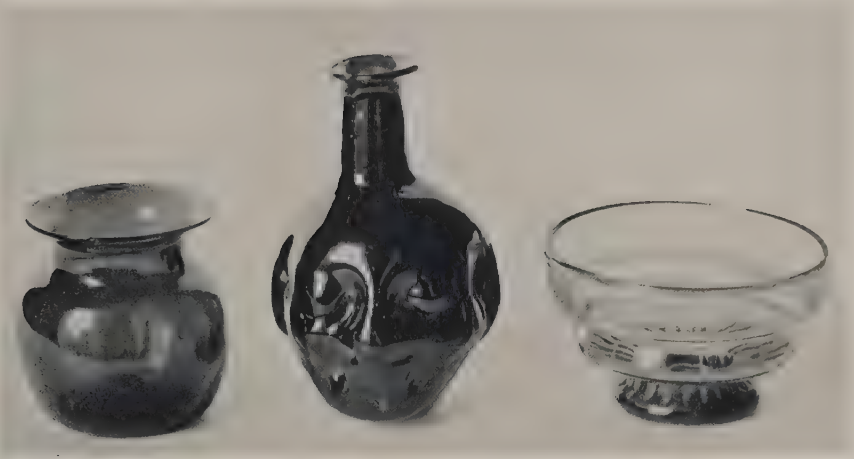
102

IRISH GLASS

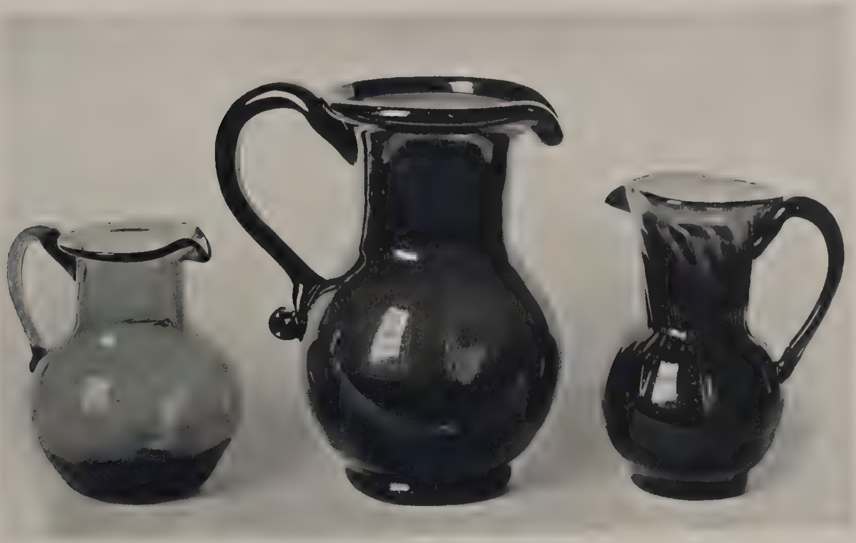


103

NORTH AMERICAN GLASS



A B C



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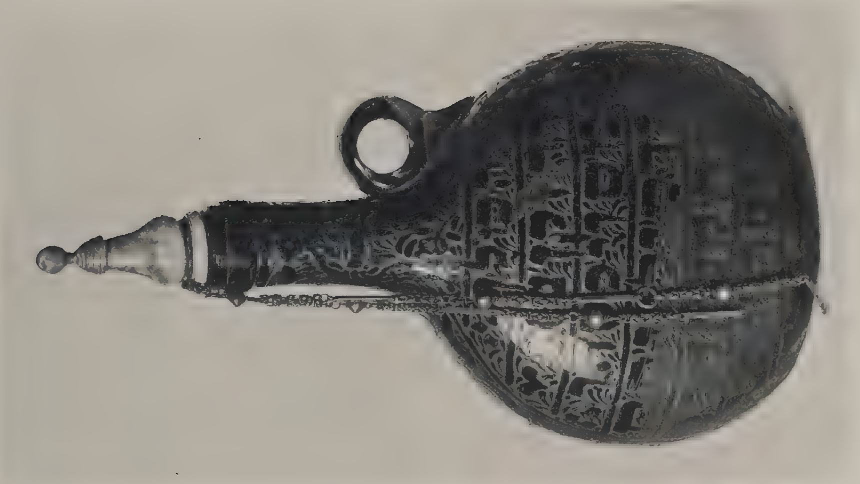
104

GLASS OF UNDETERMINED ORIGIN



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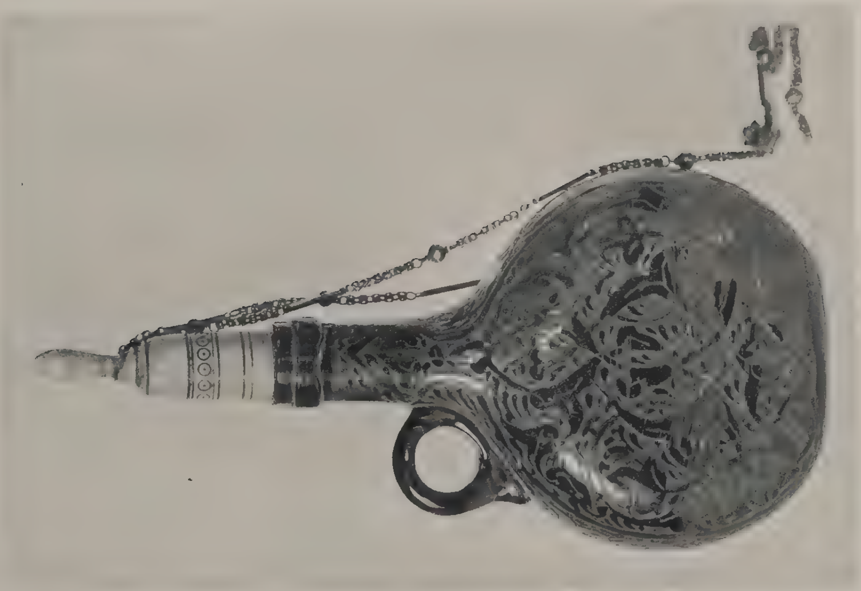

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